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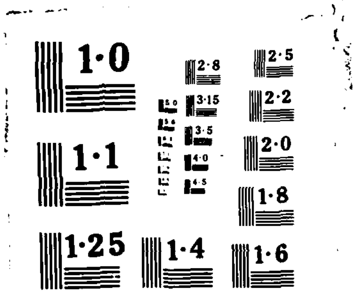
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TECHNICAL REPORT GL-86-3

GEOMORPHOLOGICAL INVESTIGATION OF THE ATCHAFALAYA BASIN, AREA WEST, ATCHAFALAYA DELTA, AND TERREBONNE MARSH

VOLUME I

by

Lawson M. Smith, Joseph B. Dunbar

Geotechnical Laboratory

and

Louis D. Britsch

Coastal Engineering Research Center

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
PO Box 631, Vicksburg, Mississippi 39180-0631

US Army Corps of Engineers

GEOTECHNICAL LABORATORY

April 1986
Final Report

Prepared for
US Army Engineer District, New Orleans
New Orleans, Louisiana 70160-0267

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Technical Report GL-86-3	2. GOVT ACCESSION NO. AD-A168 165	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) GEOMORPHOLOGICAL INVESTIGATION OF THE ATCHAFALAYA BASIN, AREA WEST, ATCHAFALAYA DELTA, AND TERREBONNE MARSH; VOLUME I		5. TYPE OF REPORT & PERIOD COVERED Final report
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Lawson M. Smith Louis D. Britsch Joseph B. Dunbar		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Engineer Waterways Experiment Station Geotechnical Laboratory and Coastal Engineering Research Center, PO Box 631, Vicksburg, Mississippi 39180-0631		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Engineer District, New Orleans New Orleans, Louisiana 70160-0267		12. REPORT DATE April 1986
		13. NUMBER OF PAGES 262
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Available from National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A geomorphological investigation of the Atchafalaya Basin, Area West, Atchafalaya Delta, and the Terrebonne Marsh was conducted in order to provide a geomorphological framework for subsequent cultural resource investigations in the region. The objectives of the investigation were to (a) define and delineate on appropriate maps the major landform units (geomorphic features) of the physical landscape of the region; (b) reconstruct, to the extent possible, the geomorphic development of the Atchafalaya Basin, Area West, Atchafalaya Delta, and Terre-

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20. ABSTRACT (Continued).

bonne Marsh areas; and (c) determine the archaeological significance of the geomorphic features in the study areas, especially in terms of aiding in locating previously unknown archaeological sites.

A series of 55 geomorphic maps at the scale of 1:24,000 depict the landforms of the four study areas. Detailed field investigations of critical sites identified during the compilation of the geomorphic maps, and subsequent sedimentological, paleontological, and chronological analysis of field samples resulted in the development of a substantial body of new data necessary for the geomorphic reconstruction of the study areas. Field and laboratory data were combined with archaeological data (site location and cultural component) in the reconstruction of the general geomorphic development of the study areas during the last 6,000 to 12,000 years.

In the Atchafalaya Basin, 11 separate types of fluvial, paludal, and lacustrine geomorphic environments were delineated. The principal geomorphic environments have been backswamp and shallow lacustrine throughout most of the Holocene, separated by lessor amounts of distributary channels and their natural levees. Vertical sedimentation in the Atchafalaya Basin has persisted throughout the Holocene, with as much as 35 m (110 ft) of sedimentation occurring during the last 12,000 years. Prehistoric cultures appear to have focused on natural levees of distributary channels and the shores of large lakes in the Atchafalaya Basin.

Ten types of geomorphic environments were mapped in the Terrebonne Marsh, Atchafalaya Delta, and Area West, (coastal plain area of the study region) with the prominent environments being fresh and brackish marshes and lakes separated by abandoned distributary channels and their natural levees. Landforms of the Maringouin (existing 6,000-8,000 BP), Teche (5,800 to 3,500 BP) and Lafourche (2,000 to 1,000 BP) Mississippi River Deltas are identified at the surface and in the subsurface of the coastal plain area. Variations in the rates and loci of deposition, subsidence, and erosion in the Terrebonne Marsh have resulted in a subsurface stratigraphic sequence which is not correlative over long distances and a substantial variability in age-depth relationships throughout the marsh, in contrast to the Atchafalaya Delta and Area West, areas where deposition and subsidence have been more uniform. Surficial archaeological sites are clustered on natural levee and beach ridges in the coastal plain area. Buried archaeological sites most likely occur beneath marsh and swamp deposits adjacent to remnant natural levees of abandoned Teche and Lafourche distributaries and adjacent to an abandoned beach ridge in the Terrebonne Marsh.

PREFACE

This investigation was authorized by the US Army Engineer District, New Orleans, Corps of Engineers, on DA Form 2544, Order No. LMNED-84-11, "General Investigation of the Atchafalaya Basin Area," dated 9 November 1983.

The investigation was performed and the report prepared during the period 1 February 1984 to 15 March 1985 by Dr. L. M. Smith, Chief, Regional Studies Unit (RSU), Engineering Geology Applications Group (EGAG), Engineering Geology and Rock Mechanics Division (EGRMD), Geotechnical Laboratory (GL), Mr. L. D. Britsch, Coastal Processes Branch (CR-P), Research Division (CR), Coastal Engineering Research Center (CERC), and Mr. J. B. Dunbar, RSU. Dr. Smith was project geologist and was responsible for organizing and supervising the study and providing assistance to Messrs. Britsch and Dunbar. Messrs. Britsch and Dunbar prepared the geomorphic maps, conducted the field and laboratory investigations and wrote Parts I, II and III. Dr. Smith prepared Parts IV and V. The investigation was conducted under the direct supervision of Dr. L. M. Smith, Chief, RSU, and under the general supervision of Mr. J. H. Shamburger, Chief, EGAG; Dr. D. C. Banks, Chief, EGRMD; and Dr. W. F. Marcuson III, Chief, GL.

Mr. J. R. May, RSU, and Dr. R. T. Saucier, Environmental Laboratory, provided valuable data and advice to the authors during this investigation. LT P. Rodriquez, CR-P, provided assistance in the field and the laboratory. Mr. E. Meisburger, CR-P, conducted the biostratigraphic analysis of subsurface samples. Ms. R. Lipscomb and Mr. B. Washington, RSU, provided valuable laboratory and drafting assistance. Dr. S. K. May, CR-P, CR, CERC, assisted in coordinating efforts between CERC and GL, and provided stimulating conversations regarding coastal geomorphic processes. In addition, Dr. H. H. Roberts from Louisiana State University (LSU), in Baton Rouge, personnel from Coastal Studies Institute at LSU, and personnel from the Louisiana Geological Survey (LGS) in Baton Rouge all extended valuable assistance which contributed significantly to this study. Ms. F. Kearns, LGS, performed the radiocarbon dating of the samples and provided enlightening discussions of the geomorphic development of the study area. Suggestions and guidance provided during this study by Messrs. T. Ryan and S. Brehm, US Army Engineer District, New Orleans, are greatly

appreciated. The report was edited by Ms. Odell F. Allen, Publications and Graphic Arts Division.

The Director of the WES during the preparation and publication of this report was COL Allen F. Grum, USA; the Technical Director was Dr. Robert W. Whalin.

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* In Volume II.

GEOMORPHOLOGICAL INVESTIGATION OF THE ATCHAFALAYA BASIN, AREA WEST, ATCHAFALAYA DELTA, AND TERREBONNE MARSH

PART I: INTRODUCTION

Background

1. Proposed US Army Corps of Engineers New Orleans District (NOD) construction projects in the Atchafalaya Basin and Terrebonne Marsh region vary from revetments on the upper Atchafalaya River to levees in the coastal marsh. Archeological managers are tasked with the responsibilities of managing cultural resource impacts of construction projects on both a regional and site-specific basis. Site-specific impacts resulting from the construction of a levee or a revetment are generally limited in area and affect only the immediate project area. Site-specific impacts can be defined with precision and are both direct and immediate. Regional impacts resulting from accelerated erosion or induced sedimentation occurring over a longer period of time may result in the destruction or alteration of the entire cultural resource base and are difficult to define. As a first step toward systematically addressing and managing cultural resources, a geomorphological study of the Atchafalaya Basin, Terrebonne Marsh, Atchafalaya Delta, and Area West region of southern Louisiana was conducted to provide a background for the evaluation of cultural resources in the area.

Purpose and Objectives

2. The purpose of the study was to develop a geomorphological framework for subsequent cultural resource investigations in the Atchafalaya Basin, Terrebonne Marsh, Area West, and Delta regions. In pursuit of this purpose, three objectives were formulated and subsequently addressed. These objectives will (a) define and delineate on appropriate maps the major landform units (geomorphic features) of the physical landscape of the area; (b) reconstruct, to the extent possible, the geomorphic development of the Atchafalaya Basin, Terrebonne Marsh, Area West, and Delta regions;

and (c) determine the archaeological significance of the geomorphic features in the study area, especially in terms of aiding in locating previously unknown archaeological sites.

Study Area

3. The study area consists of four regions as shown in Figure 1. The floodway is the portion of the Atchafalaya River Basin south of US Highway 190, bounded on the east and west by the Atchafalaya Basin Floodway levees and on the south by Bayou Teche. Area West is the region south of Bayou Teche extending west from Wax Lake Outlet to Bayou Cypremort. The Delta is the region south of Bayou Teche between Patterson and Morgan City, Louisiana, bounded on the west by the Wax Lake Outlet and on the east by the lower Atchafalaya River. The fourth region in the study area includes that portion of Terrebonne Marsh south of Bayou Black, bounded on the west by the lower Atchafalaya River and on the east by Bayou du Large. The four regions of the study area comprise approximately 5,700 km^2 (2,200 sq miles) in portions of Assumption, Iberia, Iberville, St. Laundry, St. Martin, St. Mary, and Terrebonne parishes. The study area is depicted on parts of 55 7-1/2-min US Geographic Survey (USGS) topographic quadrangles presented in Volume II.

Approach

4. During this investigation an attempt was made to extract the greatest amount of geomorphic information of possible use to the archaeologist from available data sources and from a limited amount of fieldwork. Certain limitations are inherent in these data sources, and they need to be identified at the outset. Interpretation of the landforms in the study area was by the examination of aerial photographs, LANDSAT imagery, historic maps, hydrographic surveys, archeological data, reconnaissance field inspections, and limited subsurface exploration. Available boring data for the study area were sufficient in quantity and detail to permit only a generalized knowledge of the major stratigraphic environments. Recent sedimentation has masked many preexisting geomorphic surfaces making identification of buried geomorphic features difficult.

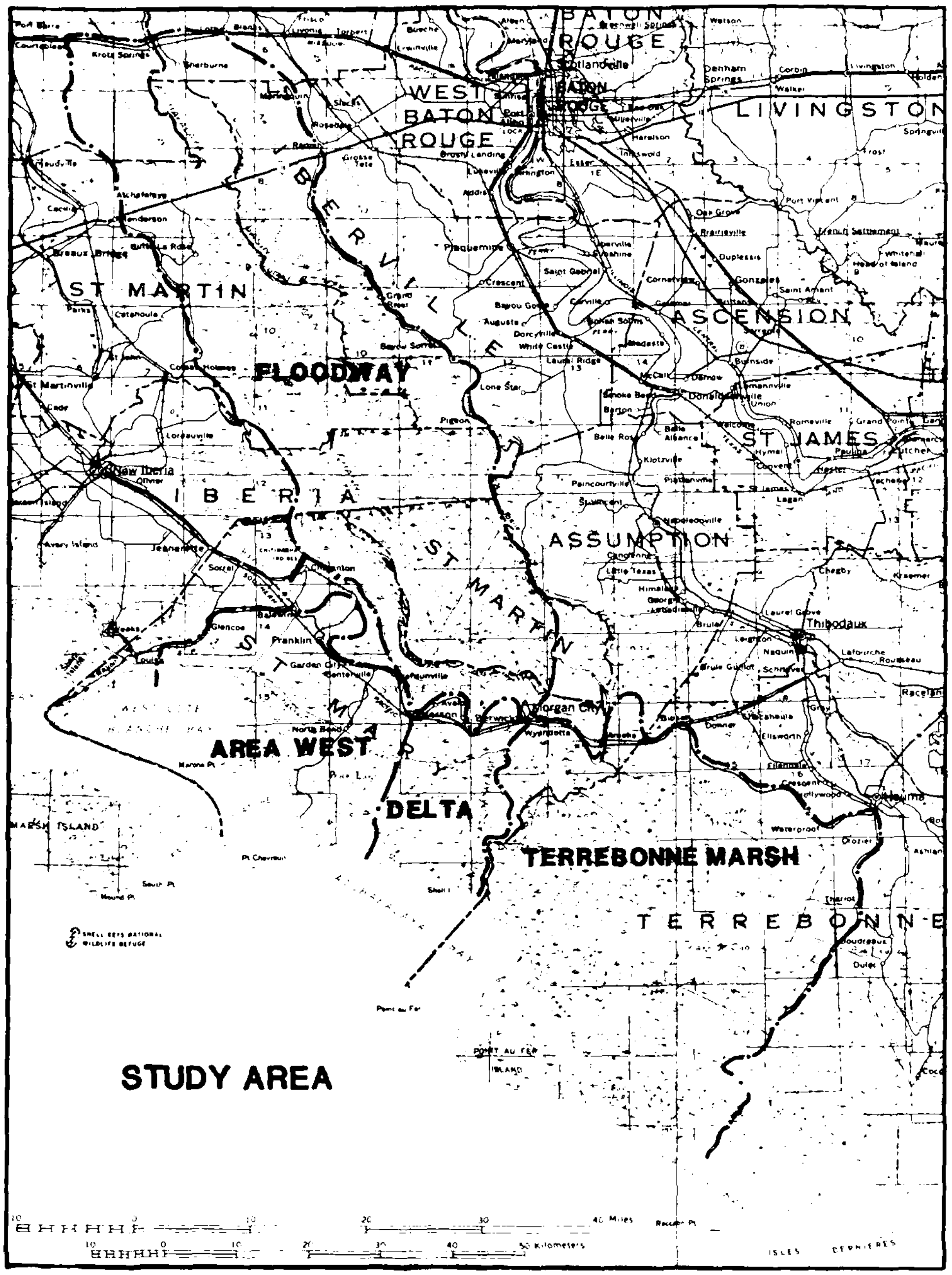

Figure 1. Study area

Additionally, subsidence and erosion in the coastal regions of the study area have virtually destroyed many features sometimes depicted on earlier historic maps and aerial photographs. Areas and rates of change are documented qualitatively wherever identification is possible. Until a more extensive field investigation is conducted, the conclusions regarding area chronology and preliminary identification of masked geomorphic features must be considered in general rather than specific terms.

Previous Studies

5. The most significant geologic study concerning the Atchafalaya Basin was prepared for the Mississippi River Commission (MRC), US Army Corps of Engineers by the US Army Engineer Waterways Experiment Station (WES) and published in 1952. This study was a detailed geological investigation conducted under the general supervision of H. N. Fisk. A detailed review of the published literature prior to the 1950's is summarized in the MRC study.

6. More recent geologic studies in the Atchafalaya Basin include the radiographic analysis of cores from deep borings (Coleman, 1966b; Krinitzsky and Smith, 1969; Krinitzsky, 1970; Krinitzsky and Lewis, 1972). Radiographic analysis provided the definition of depositional environments in the thick fine-grained deposits comprising the basin. In conjunction with the numerous geologic and historic reports on the Atchafalaya Basin, McIntire's (1958) archaeological study of coastal Louisiana provides an insight into early man's activity and the geomorphic development of the study area. Gibson (1982) conducted a detailed cultural resource investigation on the east and west Atchafalaya Basin Guide Levees, which clearly demonstrate the importance of the basin physiography as a primary influence in shaping the actions of early cultures. Gagliano and Van Beek (1975) examined man's recent use of the Atchafalaya Basin providing a wealth of data regarding the physical, chemical, and biological nature of the area.

7. A number of studies have examined the sedimentary history of Terrebonne Marsh, Area West, and the Delta. The mode of basin filling by deltas on the Gulf Coast has been defined by Scruton (1956, 1960). Frazier (1967) and Fisk (1955) using aerial photographs, borings, and radiocarbon dating have made detailed investigations

concerning the chronological sequence of deltaic progradation in the study areas. The complex nature of depositional environments associated with delta growth has been defined by Kolb and Van Lopik (1958, 1966) and Coleman (1966a) using boring data.

8. Growth of the Atchafalaya Delta has been documented by Wells and Roberts (1984), Roberts, Adams, and Cunningham (1980), and van Heerden and Roberts (1980a and b). The geology of much of the study areas has been mapped by the WES at a scale of 1:62,500 (May, in preparation.)

9. Of particular importance to the present study in both the Atchafalaya Basin and Terrebonne Marsh region were early accounts from the first settlers or explorers in Louisiana or old maps and surveys. Among these, Darby's (1816) early map of the state of Louisiana and another state map believed to be Hardee's (1871), were used to reconstruct much of the early physiography of the study areas.

PART II: PROCEDURES

Geomorphic Mapping

10. The complex depositional histories of the Atchafalaya Basin, Terrebonne Marsh, Atchafalaya Delta, and Area West are responsible for the creation of an extremely diverse geomorphic landscape in the study area. The first objective of this investigation was to define and delineate on maps the geomorphic features of these areas.

11. Definition and delineation of geomorphic features were accomplished through the examination and analysis of aerial photographs of various scales and dates, occasional subsurface data (boring logs), hydrographic surveys, and several historic maps. All known archaeological sites in the study areas were plotted on 7-1/2-min quadrangles for subsequent analysis. Specific locations of the archaeological sites are not shown on the geomorphic maps due to their sensitivity.

12. Two vintages of color infrared aerial photographs (flown in June 1983 at the scale of 1:36,000 and September 1974 at the scale of 1:60,000) were projected onto the quadrangles with a zoom transfer scope (correcting for differences in scale and photo distortions) so that both the aerial photograph and the quadrangle could be viewed simultaneously. A series of controlled mosaics of panchromatic photography (1:24,000) flown in December 1955 and October 1956 was also used. The high quality of the color infrared photography enabled the interpretation of very subtle geomorphic features with accuracy. Historic maps were used to help identify and substantiate landform delineations made from the aerial photographs. Geomorphic data are presented in Plates 1 through 58.* The results of the geomorphic mapping of the study areas are presented on a 1:250,000 scale map of the study area (Plates 1 and 2) and a series of 7-1/2 min (1:24,000 scale) quadrangles with the geomorphic features delineated (Plates 43 to 58). Each type of geomorphic feature delineated in the study area is discussed below.

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*Plates are contained in Volume II.

Geomorphic Features and Depositional Environments

Natural levees

13. Natural levees are vertical accretion deposits formed when the river flows overbank during flood stages, and sediment suspended in the flood flow is deposited overbank immediately adjacent to the channel. The resulting landform is a low, wedge-shaped ridge paralleling the channel and decreasing in thickness away from the channel. Natural levees in the Atchafalaya Basin are shown with an underlying depositional environment and have been mapped overlying point bar, lacustrine delta, or backswamp deposits. The best developed natural levee deposits are generally located in the upper third of the Atchafalaya Basin (Plates 4 to 13) or along the southern boundary of the basin on the abandoned Teche-Mississippi course (Plates 27 to 34). Natural levee deposits range from several metres to several kilometres in width. Natural levee thickness varies from less than 1.5 m (5 ft), along the numerous older pipeline canals and small backswamp or lake channels, to more than 7.6 m (25 ft) along reaches of the upper Atchafalaya River or the relict Mississippi-Teche course (May, 1983a and b, 1984). Natural levee deposits generally decrease in grain size away from the river.

14. Natural levee deposition is becoming a dominant geomorphic process in the southern third of the Atchafalaya Basin as filling of Grand and Six Mile Lakes continues. After the lakes fill to where lake bottom elevations are subaerial, vertical or overbank accretion become the primary sedimentation processes. As the southern Atchafalaya Basin lake system continues to diminish in size and Atchafalaya River flow is confined to several major channels, the geomorphic response of the Atchafalaya River to the changing stage-discharge relationship is pronounced natural levee growth. Surface extent of the natural levee deposits in the southern Atchafalaya Basin are shown on the geomorphic maps (Plates 17 through 30).

15. Natural levees in Terrebonne Marsh, Area West, and the Delta are mapped without an underlying environment because in these areas natural levee is thought to be the most significant deposit in the geomorphic development of the area. Natural levees have been mapped along the abandoned Teche- Mississippi course and the major distributaries branching from it (see Plates 2 and 3). Further to the south the former Teche

and Lafourche distributaries have undergone erosion and subsidence to the extent that natural levees are indistinguishable or buried by encroaching marshes (Figure 2). Therefore, the surface expression of natural levees in these study areas is small.

16. Natural levees are identified on color infrared aerial photographs by a change in vegetation from the lower elevation marshes and inland swamp to the higher elevation of natural levees. In the subsurface, natural levees are identified by stiff gray clay containing a small percentage of silt and fine sands, sometimes oxidized (but not necessarily), numerous root burrows, and calcareous and iron modules.

Point bar

17. Rivers migrate laterally to attain a dynamic equilibrium relationship between the various flow conditions, type and amount of sediment load, bed and bank materials, and the channel slope. Channel migration occurs as the outside bank or "cut bank" is eroded, and a lateral sandbar is deposited along the inside bank. As migration progresses, the inside of the meander becomes a series of ridges (relict lateral bars) and swales (resulting troughs between the ridges). Collectively, the series of ridges and swales comprises the point bar landform that frequently dominates the landscape of an alluvial valley formed by an actively meandering river. Point bar deposits are as thick as the total depth of the channel that formed them and fine upward texturally from the maximum size of the bedload material (fine gravel and coarse sand) through sand, silt, and clay (at the top of the deposit). The sand in the base of the point bar is deposited through lateral accretion (channel migration), and the finer silt and clay deposits overlying the coarse base are the product of vertical (overbank) accretion during floods. Point bar deposits in the study area are locally restricted to the upper third of the Atchafalaya Basin area (Plates 4 to 13) and along the former Mississippi-Teche course in Plates 28 through 30.

Abandoned channel

18. The abandoned channel is a minor depositional environment in the study area and was mapped at one location in the basin. Abandoned channels or natural cutoffs usually occur during times of flood in two ways. A highly sinuous meandering channel may cut off a single loop by cutting through its narrow neck and plugging the arms of the abandoned channel with its bedload material (usually sand). These "neck cutoffs" result

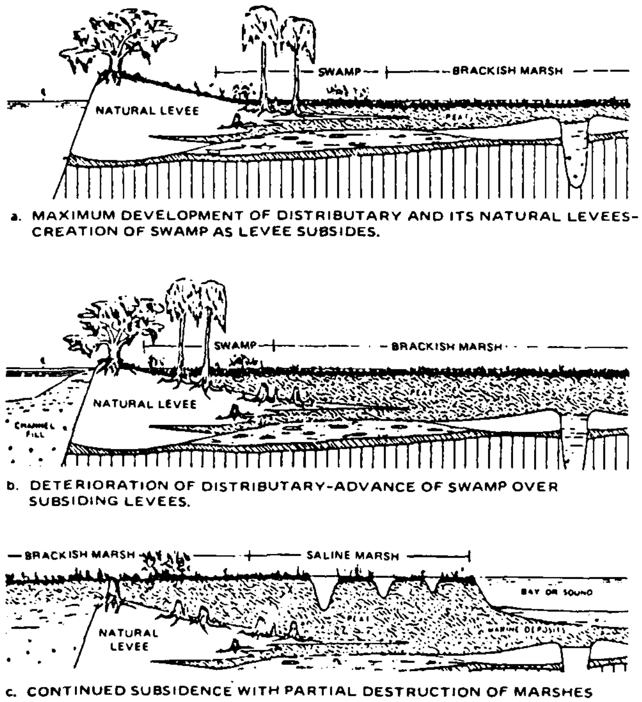


Figure 2. Encroachment of marsh over natural levee due to subsidence (after Fisk, 1960)

in the formation of an arcuate "oxbow" lake which fills slowly with fine-grained sediment. Abandoned channels may also form during high flow when the main flow is diverted through a prominent swale or chute on the point bar or accretion bank, or the flow breaks through the natural levee of a loop and rejoins the main course on the opposite, downstream segment of the loop (see Plate 19). As flow becomes concentrated in this new channel, the old channel is gradually abandoned and filled with sediment.

Abandoned course

19. Similar to the abandoned channel is the abandoned course, a relict channel segment which generally contains at least several connected meanders. The major difference between the two is the mode of abandonment. Unlike the abandoned channel, the abandoned course is formed when the main flow path is diverted to a completely new position on the floodplain creating a new "meander belt" consisting of the course and its associated point bar and abandoned channel deposits. The abandonment process is known as channel diversion or avulsion and may happen gradually or in response to a single flood. Channel diversions usually occur gradually as an increasing amount of flow is diverted through the new, more hydraulic efficient channel and the old channel progressively fills with sand, silt, and clay. In the study area, only three abandoned courses were mapped: the abandoned Mississippi-Teche course in Plates 28 through 30; the abandoned Red River course inset in the Mississippi-Teche course in Plates 28 through 36; and a short-lived abandoned Red River course in the upper basin area, breaking out of the Teche course at Port Barre through Bayou Courtableau and extending into the Krotz Springs (Plate 4) and Portage (Plate 7) quadrangles where the abandoned Red River course ends (Fisk, 1940).

Crevasse channels and splays

20. Crevasse channels are ephemeral channels originating as breaks in the natural levees of active rivers during periods of high flow. Crevasse channels extend away from the main channel and are generally shallow and usually characerized by broad natural levees. These small channels usually terminate in the backswamps or low areas flanking the active main channel and discharge flood flow and sediment into these areas. In a general sense, crevasse channels function similar to the much larger distributary channel except on a much smaller or localized scale and usually receive flow only during high

discharge periods. Crevasse channels are predominantly confined to the upper third of the Atchafalaya Basin region (Plates 4-13) and are associated with the development of the broad natural levees in this area. Crevasse channels in the Atchafalaya Basin rarely exceed 3.2 km (2 miles) in length.

21. Closely associated with crevasse channels are crevasse splays, which are coarse-grained sediments deposited at the distal end of crevasse channels. Splay deposits are recognized by their distinct triangular or semielliptical plan shape and are characterized by numerous anastomosing or interconnecting smaller channels that radiate outward in all directions. Deposition of sediments in crevasse splays occurs in response to the rapid decrease in stream competence as the flow leaves the confines of a channel and spreads laterally. Several crevasse splays were recognized in the basin and are shown in Plates 7 and 14.

Distributary channels

22. Distributary channels are channels that diverge from the trunk channel dispersing or "distributing" flow away from the main course. By definition, distributary channels do not return to the main channel on an alluvial plain or delta (Bates and Jackson, 1980). However, numerous exceptions defined by the present study and specific examples in the literature indicate that this relationship is not necessarily valid in the distributary channel classification (Shlemon, 1972; Wells and Roberts, 1981; van Heerden and Roberts, 1980a; May, in preparation). Distributary channels originate initially as crevasse channels during high flow periods when the trunk channel is unable to accommodate the large volume of discharge. If the flood is of sufficient duration, a permanent distributary channel is soon established through the initial crevasse channel. Active distributary channels are distinguished from the smaller crevasse channel by two fundamental differences: distributing channels have perennial flow and generally terminate at a semipermanent base level (a large body of open water) in contrast to crevasse channels which have flow during high discharge periods and which lead into adjacent swamps or marsh. Distributary channels typically diverge from the main channel at low angles (usually less than 60 deg) and may carry a substantial amount of flow (20 to 40 percent) from the main channel, whereas crevasse channels usually break at right angles through natural levees and typically carry no more than 10 percent of

main channel discharge. Abandonment of the distributary channel or distributary network occurs, either as a major course shift up valley or by flood flow crevassing a short distance upstream of the abandoned channel segment. Abandonment usually occurs because of an improved gradient advantage by the new course to the base level.

23. Abandoned channels in the Atchafalaya Basin not located in or immediately associated with the filling process of Grand and Six Mile Lakes are classified in this study as former distributary channels. Although distributary channels in the basin have an anastomosing or interconnecting plan form, these channels serve the primary objective of dispersing or "distributing" flow away from the trunk channel, an older Mississippi River course or the Atchafalaya River. Because of lateral constraints imposed by natural physiographic barriers (i.e., former meander belts) and artificial levees, distributary channels in the basin have had to adopt an anastomosing plan form to effectively disperse flood flow. A primary difference between a distributary channel and a smaller crevasse channel is the interconnecting or joining relationship existing between active and former distributary channels. Distributary channels do not necessarily have to be completely sediment filled to be considered abandoned. Natural levee development, general channel trend, relative channel size, and historical and archeological data associated with the channel help distinguish active and abandoned distributary channels from abandoned courses and internal basin drainage patterns.

24. Abandoned distributaries in the Atchafalaya Basin backswamp generally trend in only three directions: southeast, southwest, or due west. Lake development along the northern and eastern flank of the Teche Ridge (Lakes Fausse Point, Grand, and Six Mile) has masked former distributary channels in the western Atchafalaya Basin area. Recent natural levee deposition in the northern Atchafalaya Basin region has buried older distributary channels. The relationship between distributary orientation and former Mississippi River courses is not firmly established. The following generalizations are appropriate until a more detailed study of basin distributary chronology is undertaken (see Plates 2 to 35).

a. Southeast trending distributary channels are believed to be associated primarily with the prehistoric, historic, and recent development of the Atchafalaya River as the primary Mississippi River distributary.

b. Southwest and westerly trending distributary channels are believed to be related to five major former Mississippi River distributaries which are Post-Teche Age: Bayou Latenache, Bayou Fordoche, Bayou Blue and Grosse Tete, Bayou Plaquemine, and Bayou Corne (see Figure 3).

25. The relationship between abandoned distributaries and former Mississippi River courses is better understood south of the Teche Ridge in the Delta and Terrebonne Marsh areas because more data are available to define distributary chronology. Abandoned distributary channels generally trend due south or southwest and are related to either the Teche or Lafourche delta systems. The younger Lafouche distributaries are confined to the central and eastern edge of the study area, and the older Teche distributaries are located in the central and western margins of the study area.

26. Abandonment of distributaries in Terrebonne Marsh, Area West, and the Delta is believed to parallel closely to that of the abandonment of a course. During distributary channel abandonment, the base of the channel is commonly filled with poorly sorted sands and silts containing an abundance of organic debris. As the channel fills, the flow velocities are decreased, and the channel is filled by clay, organic ooze, and peats. Abandoned distributaries in the northern part of the deltaic plain are only a fraction of their original width and depth due to infilling. The small channel still present is partially maintained by flow from the Atchafalaya River and the Intracoastal Waterway. The abandoned distributaries in the southern part of the study areas have been subjected to tidal exchange from the Gulf of Mexico often resulting in channel enlargement.

27. On aerial photographs, abandoned distributaries are recognized by their associated natural levees and diminshed channel width. Abandoned distributaries are recognized in the subsurface by the natural levees associated with the channel fill deposits. Channel fill is recognized by parallel and wavy laminated silts and silty clays interbedded with highly burrowed clays of high water content. Distorted bedding, slump structures, organic layers, and minor shell material are also common in channel fill. Figure 4 is a photograph of a sample taken in a channel fill deposit.

Lacustrine and lacustrine delta

28. Lacustrine and lacustrine delta deposits are confined predominantly to the southern third of the Atchafalaya Basin area. These deposits account for approximately

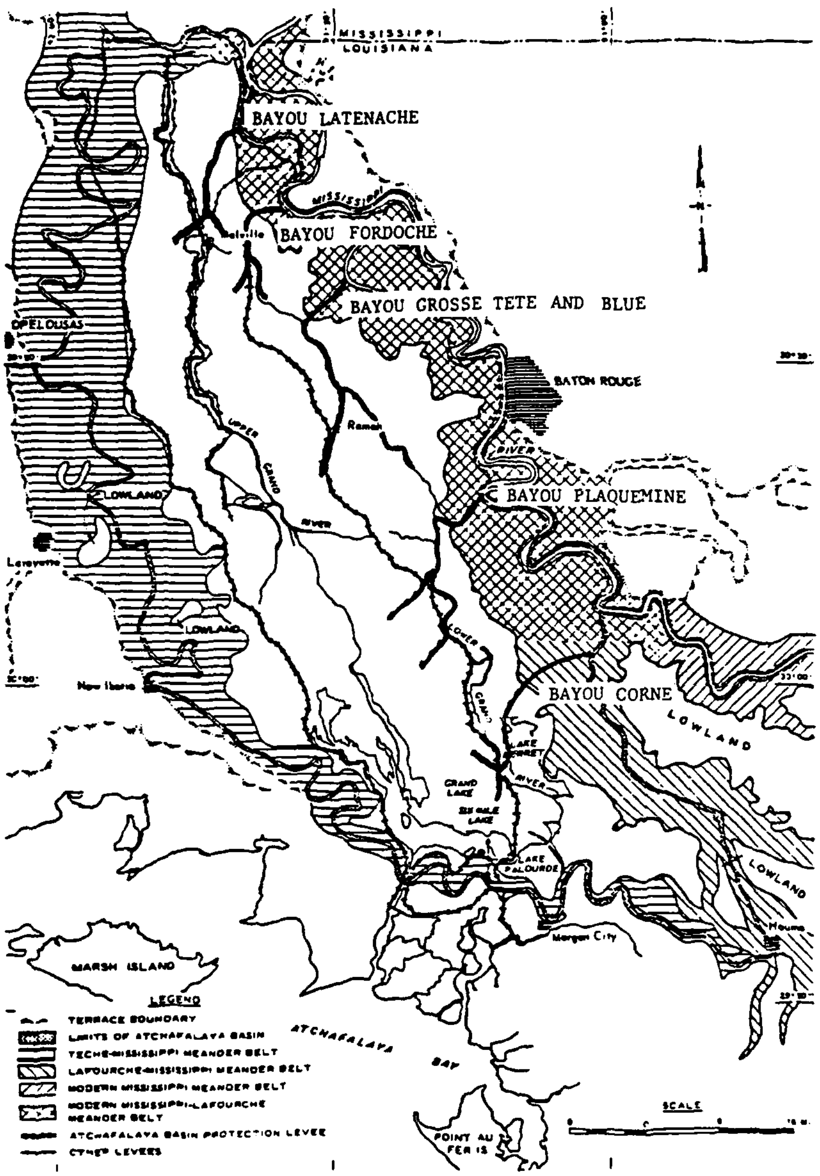


Figure 3. Major post Teche-Mississippi River distributaries draining into the Atchafalaya Basin

Figure 4. Vibracore MC-7 from a channel-fill environment

20 percent of the surface area in the Atchafalaya Basin Floodway in the study area. Lacustrine and lacustrine delta deposits are recent fresh water sediments deposited largely within the last 100 years as increased Mississippi River discharge and sediment load have been diverted to the Atchafalaya River. The once vast Grand and Six Mile Lakes acted as a receiving basin for the large quantity of sediment transported by the Atchafalaya River. Presently, the once larger Grand and Six Mile Lakes are approximately 85 percent filled as compared to the lake extent of the early 1900's which was approximately 390 km^2 (150 sq miles) in areal extent.

29. The lake filling process consists of two major subaqueous modes. Lacustrine sedimentation is characterized primarily by fine-grained deposition onto the lake bottoms which generally averaged less than 4.6 m (15 ft) in depth. The initial lake filling phase consists of deposition of a uniform clay sequence that settles out of suspension, far removed from the locus of sediment introduction into the lake. The initial sedimentation cycle is primarily dominated by vertical, subaqueous accretion. The lacustrine environment is generally characterized by quiet water conditions, abundant fresh water marine life, and occasional wind-generated waves and currents.

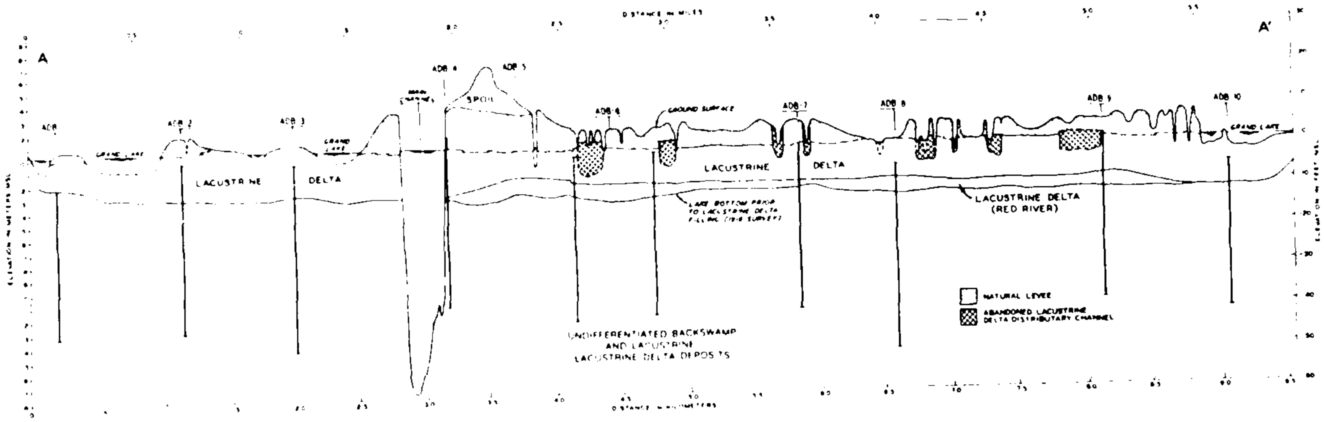
30. Lacustrine deposits in the study area consist of gray to dark gray clays with occasional silt lenses. The most prominent characteristic of the lacustrine environment is the parallel and the lenticular laminations displayed on the x-radiograph. Identification of parallel laminations using x-radiographic techniques is the most diagnostic indicator of the lake environment. Although not specifically identified by the limited number of WES vibracores from Grand Lake, the contribution of lacustrine deposition to the overall Grand and Six Mile Lake filling process is believed minor and probably accounts for less than 10 percent of total deposition.

31. The second mode of the lake filling process is the growth of the relatively coarse lacustrine delta facies. Separating the purely lacustrine deposits from the overlying coarser lacustrine delta deposits is difficult as no sharp boundary exists between the two facies. Instead, the transition is gradual with a general coarsing upward sequence as the locus of sediment contribution (channel mouth) becomes closer. Lacustrine delta sedimentation is the product of a fluvial system prograding into shallow, open water. This facies is characterized by subaqueous deposition of coarse (silty, sandy)

sediments at the river's mouth and the continued horizontal and vertical growth of the coarse facies into the open lake.

32. Deltaic processes in Grand and Six Mile Lakes parallel the seaward growth of the two deltas in Atchafalaya Bay. Both bay and lacustrine deltaic systems consist of a bifurcating distributary channel pattern that has received much recent attention in the Atchafalaya Bay area (Welder, 1959; Wright and Coleman, 1974; van Heerden and Roberts, 1980a, 1980b). Lacustrine delta deposition in Grand and Six Mile Lakes consists of a complex network of branching lacustrine distributary channels separated by coarse bars or lobes which collectively comprise the lacustrine delta. Evolution of the branching lacustrine distributaries is generally short lived as the lateral constraints imposed by the lake boundaries promote rapid filling and abandonment and continued "down lake" expansion of the lacustrine delta. Abandonment of the lacustrine distributaries occurs because of an increased hydraulic efficiency of the new channel to disperse flow and sediment as compared to the previous or current channel. Once the coarse bars or lobes become subaerial, vegetation soon colonizes the newly emergent land surface and promotes greater cohesion and stability of the surface from subsequent erosion. Natural levee or overbank deposition soon follows and becomes the dominant sedimentation process, promoting continued vertical growth of the emergent land surfaces. Cross section A-A' through the central Grand Lake area is presented in Figure 5 (see Plate 23 for location) and shows the amount or thickness of deposition that has occurred during the period 1917 to 1950, and the fairly recent natural levee growth (1950 to 1980), as the borings in the section were drilled in 1950 (after Fisk, 1951).

33. Engineering borings, WES vibracores, and field inspections of numerous subaerial islands in the Grand and Six Mile Lake region define a lacustrine delta facies ranging from silty or sandy clays at the base to predominantly fine sands interbedded with minor silt and clay laminae nearer the surface. Boring information from five WES vibracores in Grand Lake is presented in cross section B B' (Figure 6), a section through Cyprus Island (see Plates 28 and 29 for vibracore locations and Appendix A for detailed WES boring logs). Engineering borings from Cyprus Island (i.e., CI-10) define a backswamp environment underlying Cyprus Island as shown, possibly indicative of several stable island surfaces defined on early state maps throughout the Grand and Six Mile



Fiqure 5. Geologic cross section A-A' of lacustrine delta deposits (see Plate 20 for location; after MRC, 1951)

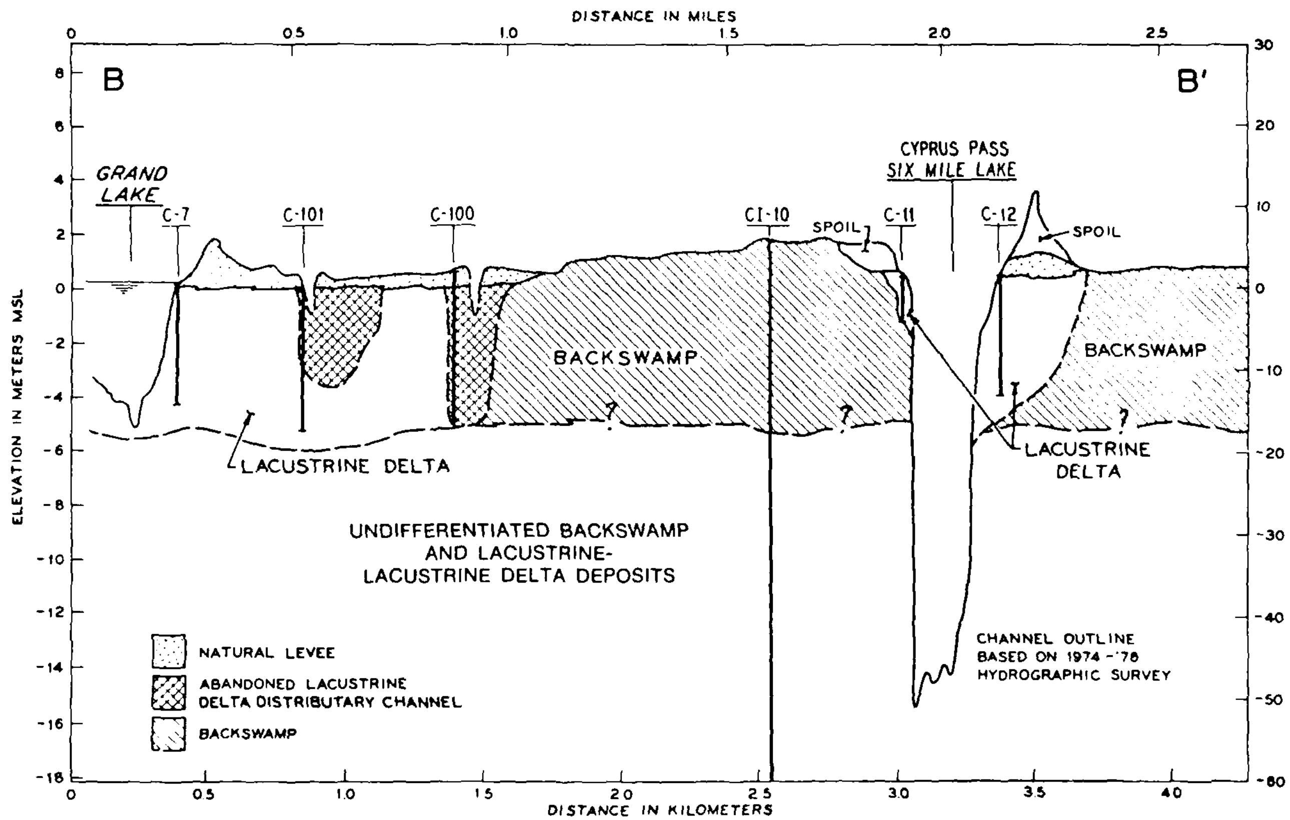


Figure 6. Geologic cross section B-B' of lacustrine delta deposits at Cyprus Island (see Plates 25-26 for section location)

Lake region which predates the lakes formation. Radiographic examination of lacustrine delta deposits defines a wide variety of stratigraphic structures: parallel and wavy laminations, cross laminations, distorted structures, ripple laminations, casts, and even thick sequences of uniform structureless silt or sand. Figure 7 is a photograph from a typical sand-rich core from lacustrine delta deposits at Cyprus Island.

Lacustrine delta channel

34. Lacustrine delta channels are historic distributary channels associated with lacustrine delta deposition. Lacustrine delta channels are distinguished from distributary channels by their association with lacustrine delta deposits. A second distinction separating the lacustrine delta channels from distributary channels is based on origin. Lacustrine delta channels are formed as a result of flow separation through the development of small elliptical lacustrine delta lobes. In contrast, distributary channels in the Atchafalaya Basin originate primarily because of crevassing and eventual abandonment of the former course for the more hydraulic efficient newer course. Lacustrine delta channels are associated with the lacustrine deltaic filling of the southern basin lake system and are generally less than 100 years old.

Backswamp

35. Backswamp is the predominant depositional environment in the Atchafalaya Basin and comprises approximately 75 percent of the basin's total surface area (Plates 4 to 35). Backswamps are poorly drained, tree-covered low areas, bounded on all sides by natural levee ridges and/or Pleistocene upland surfaces. The term backswamp is restricted to floodplain rather than deltaic environments; therefore, backswamps are confined to the study region north of the Teche Ridge. Similar areas south of the Teche Ridge, not bounded on all sides by natural levee and confined to areas predominantly deltaic in origin, are known as inland swamps and are discussed in the following section.

36. Backswamp areas receive fine-grained sediment during periods of high flow when the natural levees are overtopped and floodwaters bring fine-grained suspended sediment into low areas away from the active channel. Backswamp deposits are typically composed of massive or thick bioturbated clay sequences. Backswamp clays range in color from light yellow or dark brown to dark grey and black, depending on drainage characteristics for that region. In general, better drained backswamp deposits are

Figure 7. Vibracore C-100 from lacustrine delta environment at Cyprus Island

characterized by oxidizing conditions, lighter colors, mottling, and little organic matter. Poorly drained swamp deposits in contrast are characterized by reducing conditions, darker colors, and a much higher content of preserved organic matter, particularly in the form of roots, wood fragments, and often peat layers. Backswamp deposits contain abundant concretionary matter in the form of carbonate or siderite ($FeCO_3$) nodules and disseminated sulfides, particularly pyrite. Backswamp deposits are distinguished in radiographs from other environments primarily by the lack of stratification from bioturbation by plant roots, and abundant pyrite replacement of organic root remains. Three deep borings were drilled in the Atchafalaya Basin backswamp deposits (see Plates 9, 19, and 30 for locations and Appendix A for detailed laboratory analysis: borings M-1, L-1, and N-1).

Inland swamp

37. Inland swamp in Terrebonne Marsh, Area West, and the Delta occupies poorly drained areas bordering natural levee ridges and comprises a very small percentage of the total surface area in these three areas. These areas receive fresh water from overflow during seasonal flooding and are far enough inland so that salt water intrusion rarely occurs. Areas of inland swamp are concentrated in the northern part of the study areas close to the abandoned Teche-Mississippi course and the major Teche distributaries. Further south, salt water intrusion and lower surface elevation due to subsidence has destroyed most freshwater inland swamps. In the more inland areas, the swamp surface is less than 1 m (3 ft) higher than the surrounding marsh. On aerial photographs, inland swamp is identified by a change in tone reflecting an elevation change from well drained to poorly drained areas. In the subsurface, the occurrence of stiff massive clays containing wood and pyritized roots usually permits the identification of inland swamp deposits. Inland swamp is mapped in Plates 28 through 44.

Marsh

38. More than 80 percent of the land in Terrebonne Marsh, Area West, and the Atchafalaya Delta is covered by marsh, a nearly flat expanse where the only vegetation consists of grasses and sedges. Organic sedimentation plays an important role in the formation of marsh deposits. Peats, organic oozes, and humus are formed as the marsh plants die and are buried. Decay is largely due to anaerobic bacteria, and in stagnant

water, thick deposits of organic materials are formed. Vegetative growth maintains the surface elevation at a fairly constant level and the marsh deposits thicken as a result of subsidence (Kolb and Van Lopik, 1958).

39. Peats are the most common forms of marsh strata, and they consist of black fibrous masses of partly decomposed remains of plants. Detrital organic particles carried in by marsh drainage and vegetative tissues make up the so-called mucks. Mucks are watery oozes that can support little or no weight. Inorganic sedimentation takes place in the marsh when fluviatile floodwater overtops the natural levees, depositing clays and silts onto the marsh surface. Inorganic sediments are also brought to the marshes during lunar tides, wind tides, and hurricane tides when sediment laden marine waters inundate the marsh surface.

40. The vegetation type is largely dependent on the degree of water salinity and the elevation of the marsh. Three types of marsh were mapped in the study areas: fresh, brackish, and salt. The aerial extent of these marsh varieties is described below and was identified from the Vegetative Type Map of the Louisiana Coastal Marshes (Chabreck and Linscombe, 1978).

41. Fresh marsh. In Terrebonne Marsh, Area West, and the Delta, fresh marsh is predominantly of the floating marsh or flotant type. It consists of a vegetative mat usually 10 to 35 cm (4 to 14 in.) thick, underlayed by 0.9 to 4.6 m (3 to 15 ft) of finely divided muck or organic ooze grading to clay with depth. The most common fresh marsh species are Phragmites communis (roseau), Caldium jamaicenae (saw grass), Sagittaria lancifolia (beef tongue), Panicum hermitoman (paille fine), Scirpus californicus (bull whip), Alternanthera philoxersides (alligator weed), and Eichornia crassipes (water hyacinth).

42. Brackish marsh. In Terrebonne Marsh, the zone of brackish marsh occurs between the coastal salt marshes and the inland fresh marshes. In Area West and the Delta, brackish marsh extends out to the coastline due to lower water salinities. Brackish marsh is a transitional marsh between salt and fresh marsh. Brackish marshes, like salt marshes, are also fine-grained but have a lower inorganic content than fresh marsh deposits. The typical soils sequence consists of a root mat 10 to 20 cm (4 to in.) thick underlayed by parallel laminated peats with small zones of silty clay, which in turn

are underlayed by blue-gray clay. Common brackish marsh vegetation types are: Scirpus validus (bullrush), Typha latifolia (cattail), Phragmites communis (roseau), and Scirpus americanus (three cornered grass).

43. Salt marsh. In Terrebonne Marsh, salt marsh consists of a narrow band from less than 1 to 8 km (0.6 to 4.8 miles) wide bordering the present Gulf shoreline. Salt marsh was not delineated in the Delta or Area West. As the effects of subsidence, erosion, and artificial drainage increase, the zone of salt marsh moves further inland. Salt marsh has a slightly higher elevation (10 to 15 cm (4 to 6 in.)) than fresh and brackish marshes. The elevation increase is due to fine sand, silt, and clay brought in during high tides and storms which build the marsh surface slightly higher. Because of this increase in elevation, salt marshes are generally better drained and more firm than fresh and brackish marshes. The typical soils sequence consists of a root mat 5 to 20 cm (2 to 8 in.) thick underlayed by a firm blue-gray clay with a few roots and plant parts. Common vegetation types include Distichlis spicata (salt marsh grass), Juncus roemerianus (black rush), Spartina spartinae (needle grass), Spartina patens (couch grass), and Spartina alterniflora (oyster grass). Salt marsh was not delineated in the Delta or Area West.

Abandoned beach

44. Only one abandoned beach was mapped in the study area. It is located in Terrebonne Marsh on the Lake Penchant Quadrangle (Plate 49). Evidence such as the parallel orientation of this feature with respect to the suspected Gulf shoreline, the way distributary channels seem to end against or in the vicinity of this trend, and the presence of shell hash on the surface and in the subsurface (Figure 8) all suggest that there is a buried beach at this location. During this investigation, numerous attempts were made to core through the beach trend, but the cores either missed the trend or failed to penetrate through the shell hash. The samples that were recovered, although not conclusive, show an abundance of shell hash in the subsurface which is indicative of a moderate energy environment, a characteristic of a beach.

Deltaic deposits

45. Deltaic deposits in Atchafalaya Bay are composed of prodelta silty clays overlayed by a silty-sandy distal bar platform which is in turn capped by sandy

Figure 8. Vibracore SI-1 illustrating zone of shell hash from 30-90 cm

distributary mouth bar sediments of the subaerial phase (Roberts, Adams, and Cunningham, 1980). These dominantly sand deposits form the first subaerial expression of the emerging delta. During deltaic progradation, channels rapidly build seaward forming a complex branching network characteristic of deltas building into low energy, shallow water environments. Deltaic deposits mapped in the study area are located at the mouths of the Atchafalaya River and Wax Lake Outlet (Plates 39 and 46). Deltaic deposits were recognized on aerial photography by their lobate shape and bifurcating pattern. Site inspections of several islands in Atchafalaya Bay revealed that deltaic deposits are composed predominantly of fine-grained sand containing a variety of small-scale cross laminations.

Interdistributary bay

46. Interdistributary bay deposits are sediments deposited in low areas between active distributary channels, usually under brackish water conditions. Sediment charged water during flood stage overflows the natural levees of distributary channels, depositing the coarsest sediment (silt) near the channel on the natural levee flask. The finer sediment (silty clay and clay) is transported away from the distributary channel and settles out of suspension as interdistributary bay deposits. As interdistributary bays become filled and reach sea level, they are populated by marsh vegetation.

47. Interdistributary bay deposits were not mapped as surface environments in the coastal study areas because they have been covered by marsh deposits. Interdistributary bay deposits are recognized in the subsurface as consisting of saturated gray clays which are highly bioturbated, contain some silt laminae, and a large amount of shell material distributed throughout the sequence. Interdistributary bay deposits range from 1.5 m (5 ft) to more than 5 m (15 ft) in thickness in the Terrebonne Marsh. Figure 9 is a photograph of a vibracore containing interdistributary bay deposits.

Field Sampling

Shallow borings

48. The primary objective of the sampling phase of the investigation was to obtain datable materials (usually peat), predominantly from under the flanks of natural levees,

Figure 9. Vibracore LD-7 depicting interdistributary bay deposits (tubes 3-6) overlain by marsh (tubes 1 and 2)

to accurately date and define the chronology of the complex alluvial and deltaic setting. A second objective was to define the underlying environments of deposition and their characteristics as related to fluvial and deltaic growth.

49. The majority of cores was obtained with a vibracore sampler. The vibracore technique allows retrieval of relatively undisturbed samples from unconsolidated, saturated sediments. The vibracore works on the principle of liquefaction in fine-grained sediments by displacing sediment to allow passage of the core barrel (Smith, 1984). The effectiveness of the vibracore in relation to penetration and recovery is directly related to the type of sediment being cored. The vibracore works best in saturated fine sands, silts, and silty clays, but is very inefficient in firm clays.

50. Vibracore equipment (see Figure 10) consists of a 5 hp gasoline engine designed for use as a concrete vibrator, and a 6 m (20 ft) flexible shaft attached to a 30 cm (12 in.) vibrator head. The vibrator head is attached to a 7.62 cm (3 in.) diameter, 9.1 m (30 ft) length of aluminum irrigation or sampling pipe by a pair of U bolts. A tripod was used to support the long sample pipe during the initial vibracoring stages and later to provide a sturdy frame to remove the long sample pipe from the ground. The tripod was designed from three 3 m (10 ft) pieces of 5.08 cm (2 in.) steel pipe bolted to a .09 m^2 (1 ft^2) square piece of aluminum at the top and fitted to a 1.2 x 1.2 m (4 x 4 ft) piece of plywood at the base.

51. Sampling consisted of hoisting upright the vibrator head and pipe into a slot in the tripod and vibrating the pipe into the ground. The pipe was vibrated into the ground at a low vibration frequency to reduce sample compaction. After the pipe had reached its maximum penetration, a 7.62 cm (3 in.) packer was placed in the end of the pipe and tightened to create a vacuum to prevent any sample loss. A 2-ton chain hoist fastened to the tripod was attached to the top of the pipe by a chain, and the core was slowly winched out of the ground. After the sample was recovered, the pipe was cut into 3 m (10 ft) lengths for later transport to WES for laboratory analysis.

Deep borings

52. In addition to the numerous vibracores, seven deep borings were drilled in the Atchafalaya Basin and Terrebonne Marsh. The deep borings were drilled with a Failing 1500 Drill Rig. Sampling was continued in each boring to a depth of 30.5 m (100 ft) using

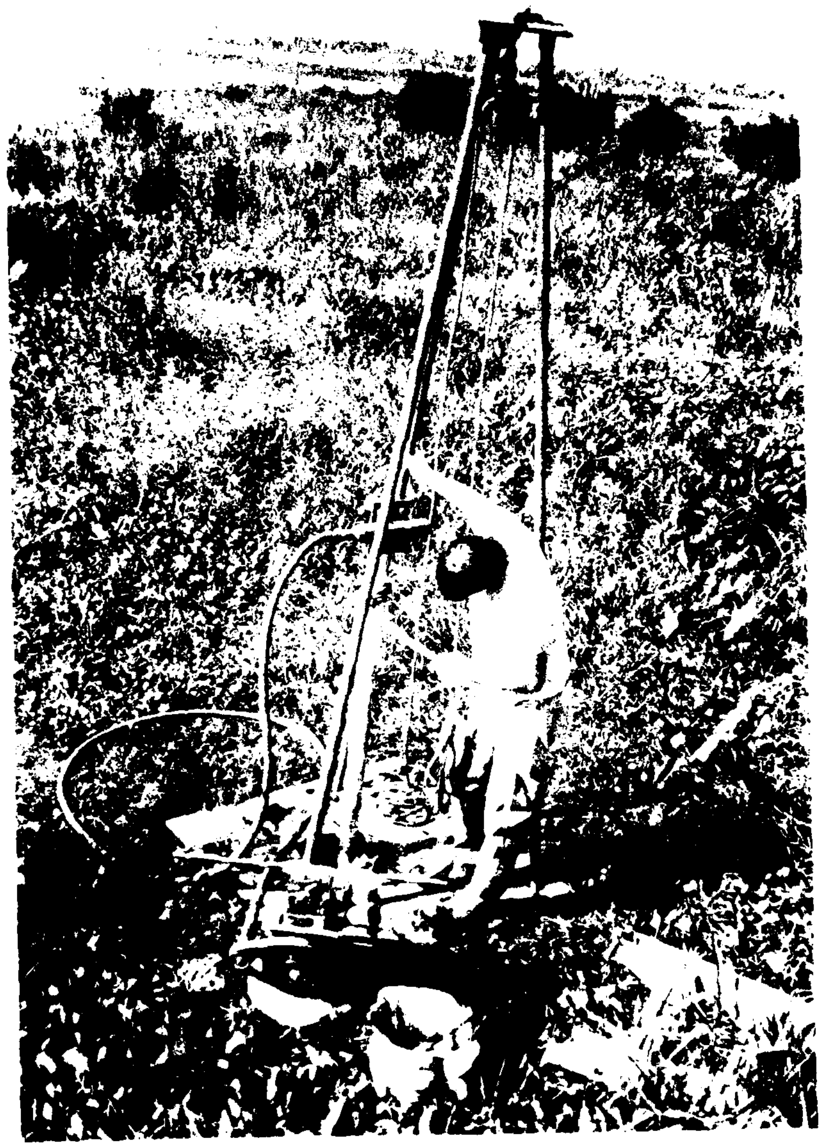


Figure 10. Vibracore operation and equipment

a modified, 7.62 cm (3 in.) diameter, Shelby tube sample, and 76 cm (2.5 ft) Shelby tubes. Samples were pushed every 61 cm (2.0 ft), and borings were advanced between samples with a 17.8 cm (7 in.) baffled fishtail bit. Shelby tube samples were sealed with packers on either end to preserve sample quality. Borings were backfilled with a grout mixture after completion.

Laboratory Analysis

Sample preparation and boring logs

53. Vibracore samples in the laboratory were cut into 100 cm (3.28 ft) lengths and split into two half cylinders longitudinally. Half of the sample was stored for reference; the other half was split into 25 cm (10 in.) increments for subsequent analyses. Laboratory analysis of vibracore and Shelby tube samples consisted of preparation of detailed boring logs, complete x-radiographic and biostratigraphic analyses, and radiometric age determination of all datable materials. Data noted in the boring logs include lithology, texture, color, approximate moisture content, sedimentologic structures, relative organic content, biostratigraphy, estimates of salinity, and a determination of the depositional environments based on the above information. Boring logs from this investigation are presented in Appendix A. Boring locations are referenced on the boring logs and are located on the respective geomorphic maps in Volume II.

X radiographs

54. Radiographic techniques permit the inspection of subtle depositional and structural details not evident in normal examination. Because an important phase of the project involved interpretation of depositional environments, all cores were x-rayed to obtain the maximum amount of stratigraphic information. Radiographic samples were prepared from the working half of each boring and consisted of preparing 1-cm (0.4-in.) thick by 25-cm (10.0-in.) long slabs of the entire boring. The slabs were individually wrapped in plastic wrap to prevent drying. The procedure involves placing the slab onto x-ray film and exposing the sample to radiation. X-rays are absorbed differentially, depending on variations in density, composition, and structural patterns in the sample. The absorption patterns are registered on the x-ray film as a photographic image. A Phillips

Industrial X-ray unit with an automatic calibrated exposure meter set at 50 kv and 5 mA was used to generate the x-ray radiation. Kodak RediPak Type M industrial x-ray film was used in x-raying the samples. Standard developing procedures were used in developing the Kodak Type M film.

Biostratigraphy

55. A biostratigraphic analysis was conducted on all cores from Terrebonne Marsh as an aid in determination of environments of deposition. A total of 261 samples was taken from selected intervals in the numerous cores and analyzed to provide additional information on the various lithologic units present. The biostratigraphic analysis identified the primary biogenic elements, consisting mainly of plant fragments, foraminifera, ostracods, mollusks, diatoms, and rare amounts of bryozoa and barnacles. The relative abundance of these biogenic elements and their affinity for certain environments make biogenic elements fairly accurate indicators of specific depositional environments.

56. Two distinct foraminiferal assemblages occur in the numerous cores. One assemblage is composed entirely of agglutinated species, and the other contains all calcareous byaline species with one exception: salsum, an agglutinated type (Table I). Not all the species listed in Table I are present in each sample. The species of the agglutinated assemblage are a characteristic of brackish and saline marshes, having less than full ocean salinity. The species of the calcareous assemblage are adapted to a wider variety of conditions and range from the upper reaches of estuaries to the offshore environment. The absence of porcellaneous species, foraminiferal test having a calcareous wall with dull white luster in the assemblage indicates that these deposits were not emplaced in an open marine setting, but in waters of lower salinity.

57. Two nonspecific characteristics of the two assemblages provide additional information. Both the agglutinated and the calcareous assemblages in the Terrebonne Marsh cores are of relatively low diversity and in most cases have a high species dominance, suggesting a somewhat restricted environment such as an enclosed bay or estuary. This correlation fits well with the environmental determinations made from the radiographs and core samples. The biostratigraphic information is included in the boring logs in Appendix A.

Radiocarbon dating

58. Radiocarbon dating was used to accomplish two goals. The first was to obtain dates on horizons in the Atchafalaya Basin in order to develop a general vertical chronology of basin filling. The second objective was to define the chronology of deltaic progradation into Terrebonne Marsh, Area West, and the Delta.

59. The most common datable material encountered in the cores was peat. Peat was usually located stratigraphically in backswamp deposits in the Atchafalaya Basin and between natural levee and interdistributary clays in the Terrebonne Marsh. Lessor amounts of wood, shell material, and organic clay were present in the samples. Wood and shell material was usually chosen only when peat or organic clay was not present due to the possibility that wood and shell may have been transported and might yield an unreliable date.

60. A total of 60 samples was submitted for dating to the Louisiana Geological Survey at Louisiana State University in Baton Rouge and the University of Texas at Austin. Sample results are presented in Appendix B. Included with the results are standard laboratory pretreatment practices and specific information on dating techniques. Six sample dates from three borings were not used in the analysis to define the geomorphic chronology of the study area because laboratory handling or pretreatment procedures are believed to have caused sample contamination that resulted in erroneous dates. Radiocarbon dates or samples that were not used in this analysis are as follows: LD-1-1 (Plate B24), LD-1-2 (Plate B25), LD-1-3 (Plate B26), LD-7-1 (Plate B30), and SI-1-1 (Plate B33). Insufficient sample was available to date MC-S-1 (Plate B13). In addition, samples (Plates B49 to B63) to determine the Area West distributary chronology were provided by Kearns (1985). Boring locations and logs from Kearns borings are not included in this report.

PART III: GEOMORPHIC DEVELOPMENT

Regional Geomorphic Development

61. The Atchafalaya Basin, Terrebonne Marsh, Area West, and the Delta all belong to a complex seaward thicking wedge of sediments that occupy a small portion of the Lower Mississippi Alluvial Valley and the central and western regions of Louisiana's deltaic plain. Progradation of the present and former Mississippi River courses and deltas are responsible for creating the recent alluvial valley and deltaic plain of southeastern Louisiana. Each time the Mississippi River has built a major delta lobe seaward, it has subsequently been abandoned in favor of a shorter, more direct route to the sea. These meander belt changes in the alluvial valley and accompanying shifts in centers of deposition have resulted in the distribution of deltaic sediments along the coast of southeast Louisiana. Soon after a delta lobe is abandoned, marine transgression caused by compaction and subsidence of deltaic sediments begins. Nevertheless, the net result between the advancing deltas and the encroaching sea has generally been an overall increase in the size of the recent coastal plain (Kolb and Van Lopik, 1966). However, within the last few decades, coastal land loss has accelerated as man's recent use of the marsh has opened it to processes of chemical and physical erosion in addition to man's activity in restricting the sediment supply to these areas.

62. The geologic history of the Lower Mississippi Alluvial Valley and deltaic plain has been determined from more than 30,000 borings and hundreds of radiocarbon age determinations. Information gained from these data indicates that over the past several thousand years there have been marked changes in the alluvial valley and Louisiana's coastline. The evolution of the study area is closely related to shifting Mississippi River courses. The Mississippi River has changed its course several times during the last 8,000 years, forming a complex setting in which to observe the various aspects of fluvial and coastal sedimentation. Important contributions to the understanding of the history of the lower alluvial valley and the deltaic plain have been made by Fisk (1944, 1952, 1955), Fisk and McFarlan (1955), McFarlan (1961), Kolb and Van Lopik (1966), and Frazier (1967).

63. During the last glacial advance, the Late Wisconsinan Stage, continental ice accumulation caused sea level to be lowered some 90 m (295 ft) below its present level (Dillon and Oldale, 1978). As a result, the Louisiana shoreline was as far as 160 km (100 miles) south of its present position (Kolb and Van Lopik, 1958). Lowered sea level led to the entrenchment of gulfward-flowing streams and their tributaries into the newly exposed deposits of the Pleistocene Prairie Formation, deposited during the Sangamonian Interglacial period. The Prairie Formation is recognized in the subsurface by its erosional contact, its light-colored oxidized deposits resulting from subaerial exposure during lowered sea level, relatively high bulk density, and low water content. Entrenchment of the ancestral Mississippi River into the Prairie Formation formed an alluvial valley with branching tributary valleys approximately 16 to 40 km (10 to 25 miles) wide which trended southeast across the coastal plain approximately 25 km (15 miles) west of Houma, Louisiana (Kolb and Van Lopik, 1966). The present limits of the study area are approximately located in the western valley margin and central interior portions of the ancestral alluvial valley.

64. Between 17,000 and 20,000 years before the present (BP), sea level began to rise as a result of glacial melting and regional subsidence of the coast (Kolb and Van Lopik, 1966; Nummedal, 1983). Streams alluviated the entrenched valley with coarse sediments in order to adjust to the rise in base level. As sea level continued to rise, deposition of coarse sediments was forced farther up the alluvial valley. Closer to the Gulf, shallow marine sediments were deposited over coarse basal fluvial sediments as the shoreline transgressed northward. As sea level continued to rise, both the quantity and grain size of detritus supplied to the streams decreased, leaving only fine sands, silts, and clays for deltaic deposition (Kolb and Van Lopik, 1966).

65. Between 4,000 and 7,000 years ago a stillstand of sea level occurred at approximately the present level (Nummedal, 1983). This stillstand however, has not been one of stationary sea level. Global sea level has been oscillating about a steady mean for approximately the past 4,000 years. These oscillations have amplitudes of 1 to 2 m on time scales of hundreds of years (Nummedal, 1983). The Mississippi River began building a series of lobate deltas in a gulfward direction as a result of a stationary sea level, displacing the Gulf waters that had extended up the Mississippi River alluvial

valley to the latitude of Baton Rouge, Louisiana (Kolb and Van Lopik, 1966). The Mississippi River and its associated deltas shifted several times during this gulfward growth of land. The Atchafalaya Basin throughout this period was a low area bordering the trunk ancestral Mississippi River courses, into which fine-grained sediment from the different courses was received by overbank deposition.

66. The history of the study area is dominated by deltaic growth. The Mississippi River deltaic plain is composed of an active and several inactive deltaic complexes extending some 288 km (180 miles) across southeast Louisiana. Several major deltaic complexes have formed during the last 8,000 years and have been identified in coastal Louisiana. These complexes reflect changes in the course of the Mississippi River. From oldest to youngest, the deltaic complexes are the Maringouin, Teche, St. Bernard, Lafourche, and the Plaquemine and present (Balize) delta as shown in Figure 11. The relative ages of these complexes are well established, but the absolute ages are less accurate. Ages were derived from radiocarbon data obtained during this investigation as well as archeological evidence (McIntire, 1958) and dates published in previous studies (Frazier, 1967 and McFarlan, 1961).

67. The earliest delta lobe, the Maringouin, is thought to have prograded from the western margin of the alluvial valley and into deltaic plain sometime between 6,000 and 8,000 years BP. Progradation of the Maringouin Delta took place during a short stillstand of sea level when sea level was approximately 12 to 18 m (40 to 60 ft) lower than its present level (Frazier, 1967). The Maringouin system has been mapped as the most extensive delta lobe in the Mississippi River Deltaic Plain by Frazier (1967). Since deposition of the Maringouin, erosion, subsidence, and burial by subsequent deltaic deposition have made it difficult to reconstruct the exact limits, location, and upvalley extent of this system. In the Atchafalaya Basin, fine-grained deposition related to later Mississippi courses has buried evidence of the Maringouin system.

68. Approximately 5,800 years BP, the initial progradation of the Teche delta began in the western part of the deltaic plain (Frazier, 1967). Gradually, the major locus of Teche deposition shifted eastward towards Houma, depositing sediments in a southeastward direction. The Teche-Mississippi System was actively depositing sediments in this area until approximately 3,500 BP when the Mississippi River shifted far to the east

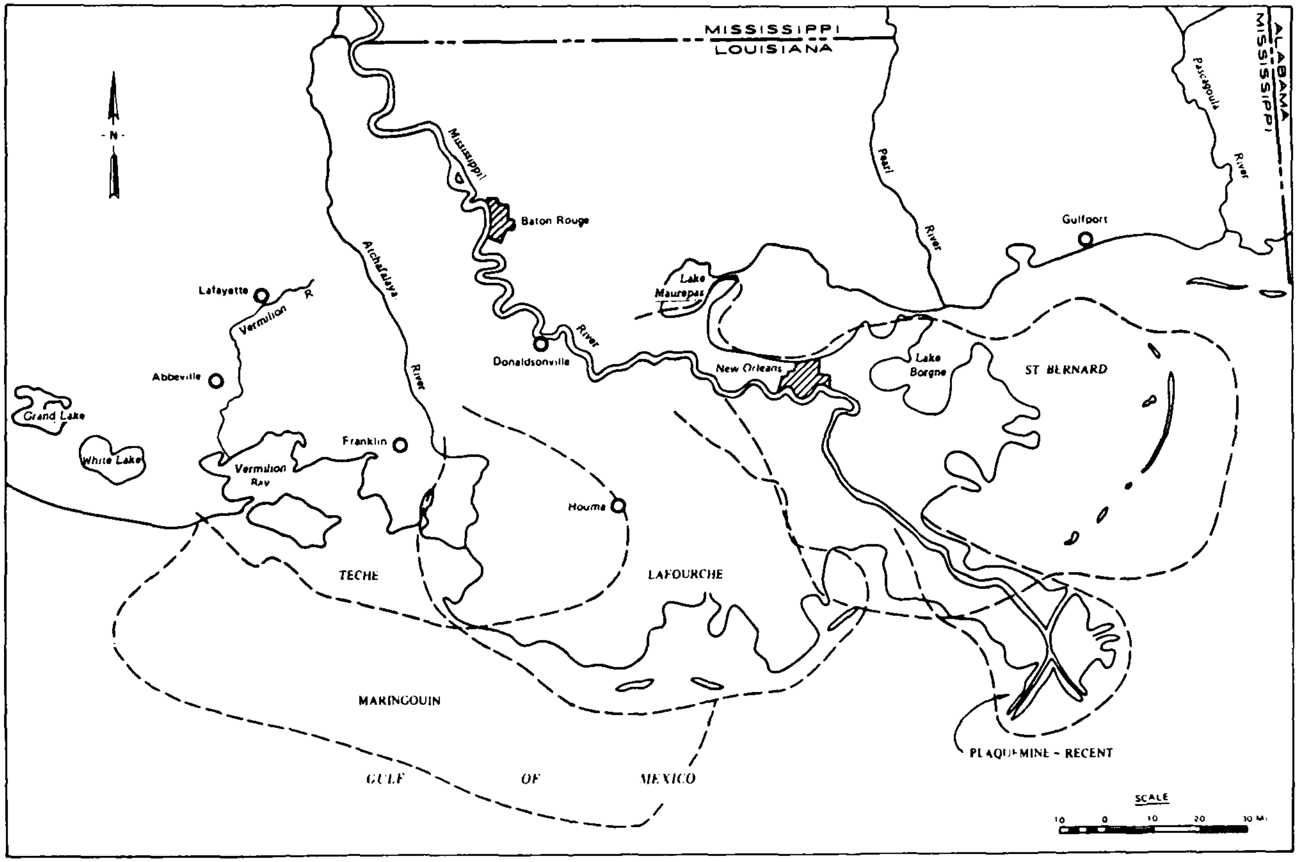


Figure 11. Major Mississippi River deltaic lobes (Modified after Frazier 1967)

and started building the St. Bernard Delta. The Mississippi River continued to build the St. Bernard Delta until approximately 2,000 years BP when flow was diverted westward and the Lafourche delta began to prograde seaward. The Lafourche Delta continued to receive minor flow from Bayou Lafourche until 1904 when the mouth of the bayou was dammed (Frazier, 1967). Abandonment of the Lafourche course for the Plaquemine-Modern lobe occurred approximately 500 years BP.

Coastal Subsidence

69. The variability in depositional environments brought about as a result of deltaic progradation makes it extremely difficult to accurately determine a single rate of subsidence in a given area. Rates of subsidence vary with respect to location of the deposits (e.g., natural levees versus interdistributary deposits) and are dependent on local geologic conditions such as the depositional environment, the age of the sediments, and the depth to the Pleistocene. Therefore, a rate of subsidence derived for one location may be far different from the rate a short distance away where local geologic conditions differ. Scientists are just recently starting to build a comprehensive and precise data set including tidal gage data, benchmark elevations, and radiocarbon dates to be used in defining subsidence in this region. Previous estimates of subsidence in south Louisiana include 3.2 mm/year of average regional subsidence for the last 3,500 years (Penland and Boyd, 1983), 1.2 mm/year for the Lake Pontchartrain basin (Saucier, 1963), and 1.1 mm/year of regional subsidence for the last 3,500 years (Gagliano and Van Beek, 1975). As more data becomes available, these regional estimates can be broken down into estimates for specific areas along coastal Louisiana.

Geomorphic Development of the Atchafalaya Basin

Physiography

70. The Atchafalaya Basin is a large, shallow depression bounded by present and former Mississippi River courses. The floodway trends in a generally northwest to southeast direction with Krotz Springs at the northern limit of the study area and Morgan City at the southern end of the basin, approximately at the midpoint of the study area (see Figure 1). Approximately 50 percent of the study area is contained in the basin

which averages about 2,834 km^2 (1,088 square miles), measuring approximately 109 km (68 miles) in length and 26 km (16 miles) in width.

71. The natural levees of the Atchafalaya River and former Mississippi River courses such as Bayou Teche are the most prominent physiographic features in the basin. In general, elevations in the northern portion of the study area are higher and range from approximately 7.6 m (25 ft) mean sea level (msl) to less than 1.0 m (3 ft) msl in the southern limits of the basin near Morgan City. The floodway consists almost entirely of swamps and numerous shallow lakes. The lakes are predominantly confined to the southern half of the floodway and include Grand, Six Mile, and Flat Lakes. Lakes Fausse Pointe, Verret, and Palourde were separated from the floodway lake system upon completion of the floodway guide levees during the 1930's. In recent years, increased sedimentation from 30 percent diversion of Mississippi River flow into the Atchafalaya Basin has almost filled the Grand-Six Mile Lake system.

Geomorphic development

72. Early to late Holocene. Knowledge of the study area for the time frame between 10,000 and 1,500 years BP or the period from early to late Holocene is primarily dependent on boring data. Numerous engineering borings drilled predominantly for levee and highway construction define a subsurface consisting of two major units: a coarse basal unit known as the substratum and an overlying fine-grained unit commonly called the topstratum. The substratum consists of coarse sands and gravels deposited in the entrenched valley system during the rising sea level stage following the last Pleistocene glaciation. The substratum represents braided stream deposits which in the northern portion of the basin occur at an average depth of approximately 25 m (82 ft). In the southern portion of the basin, depth to substratum sands averages approximately 35 m (115 ft). Depending on location within the basin, substratum sands and gravels vary in thickness from approximately 46 m (150 ft) in the northern end to more than 107 m (350 ft) in the southern end (May, 1983a and b).

73. Directly overlying the substratum is the topstratum, a thick fine-grained unit consisting predominantly of sandy clay, silty clay, and clay. Until fairly recently, the Atchafalaya Basin topstratum was believed to have formed entirely in a backswamp environment. However, sample radiographs define lacustrine and lacustrine delta

deposits in Atchafalaya Basin topstratum deposits (Coleman, 1966b; Krinitzsky and Smith, 1969; Krinitzsky, 1970; Krinitzsky and Lewis, 1972). Subsurface data have defined the early basin as a broad backswamp and shallow lacustrine region bordered by major fluvial systems of the Mississippi and Red Rivers. Periodically, this low basin area has received floodwaters depositing the fine-grained sediments that characterize the basin topstratum deposits. The stratigraphy of the Atchafalaya Basin reveals that the basin was occupied by shallow lakes and broad backswamps throughout much of the Holocene.

74. Borings drilled for this study were combined with earlier WES borings and x-radiographic data to define a complex subsurface of interfingering swamp and lake (including lacustrine delta) facies throughout the vertical sequence of topstratum deposits. Cross sections C-C', D-D', and E-E' in Figure 12 show the complex interfingering relationship for three regions in the basin (after Krinitzsky and Smith, 1969). Radiocarbon data from numerous borings within or near the basin study boundary date the topstratum at generally less than 10,000 years BP. The results of approximately 55 radiocarbon dates are summarized in Table 2 to show the general vertical accretion chronology of only the Atchafalaya Basin topstratum and substratum deposits (McFarlan, 1961; Fraizer, 1967; Coleman, 1966b ; Krinitzsky and Smith, 1969). Radiocarbon data from WES borings (L-1, M-1, and N-1) drilled for this study are included in the general chronology.

75. The first advance of a major fluvial system into the basin in the last 7,000 years occurred by the Maringouin system. Sea level at this time was at a stillstand, well below the present level. Fisk (1944) interpreted Bayou Maringouin and eastern basin backswamp drainage patterns as belonging to this system. Frazier (1967) defined a Maringouin system buried in the mid portion of the basin only a few kilometres east of the present Atchafalaya River. Kolb and Van Lopik (1958) concluded that during this same time period, the trunk channel of the Sale-Cypremort delta was the major fluvial system active in the basin and located along the eastern basin margin. Saucier (1974) suggested that the Maringouin system in the basin area was confined to the western side of the alluvial valley, near the vicinity of the later Teche-Mississippi course. Data from WES borings and the geomorphic mapping were unable to substantiate the conclusions expressed by the above workers; rising sea level and subsequent floodplain deposits have

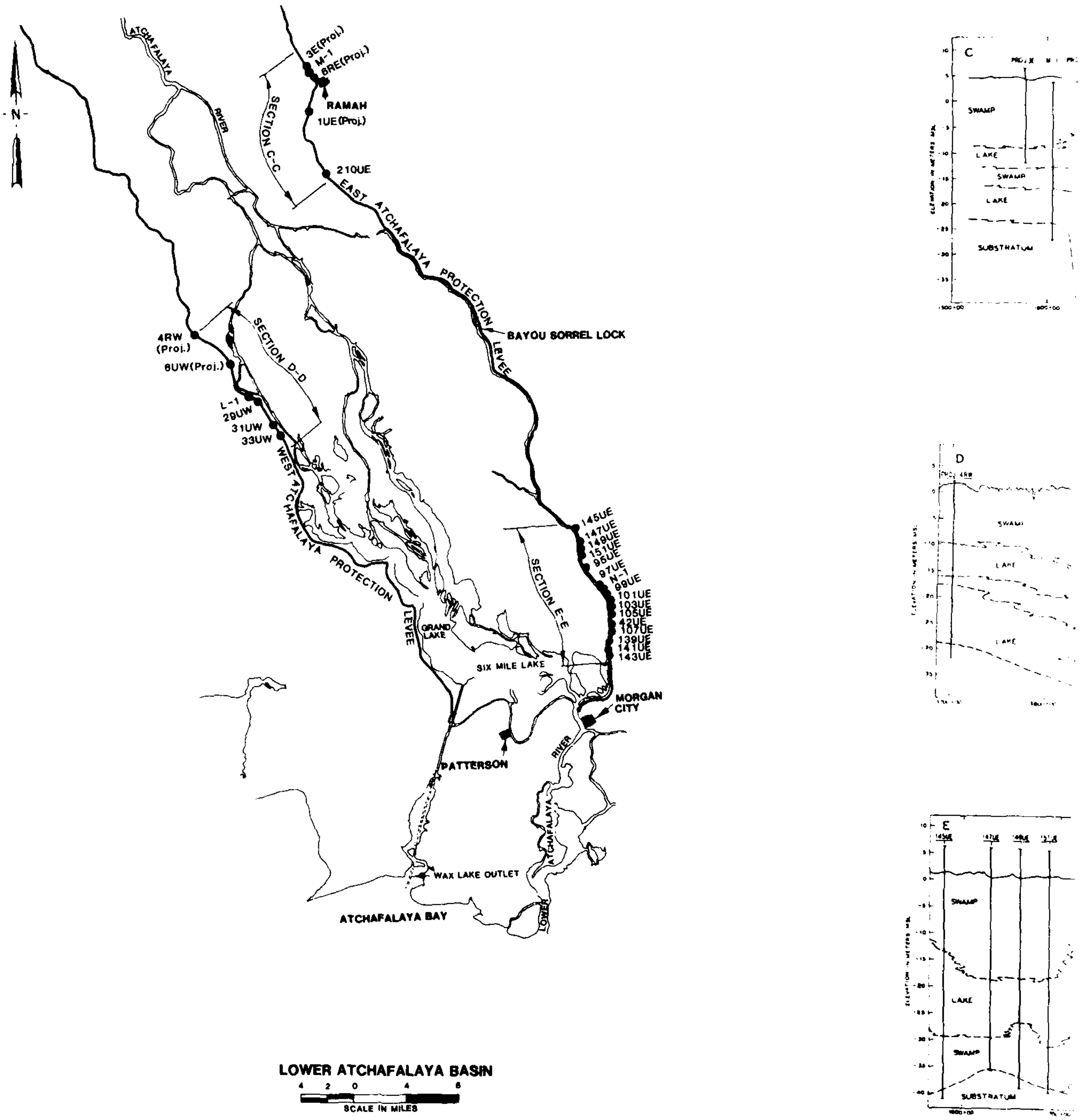
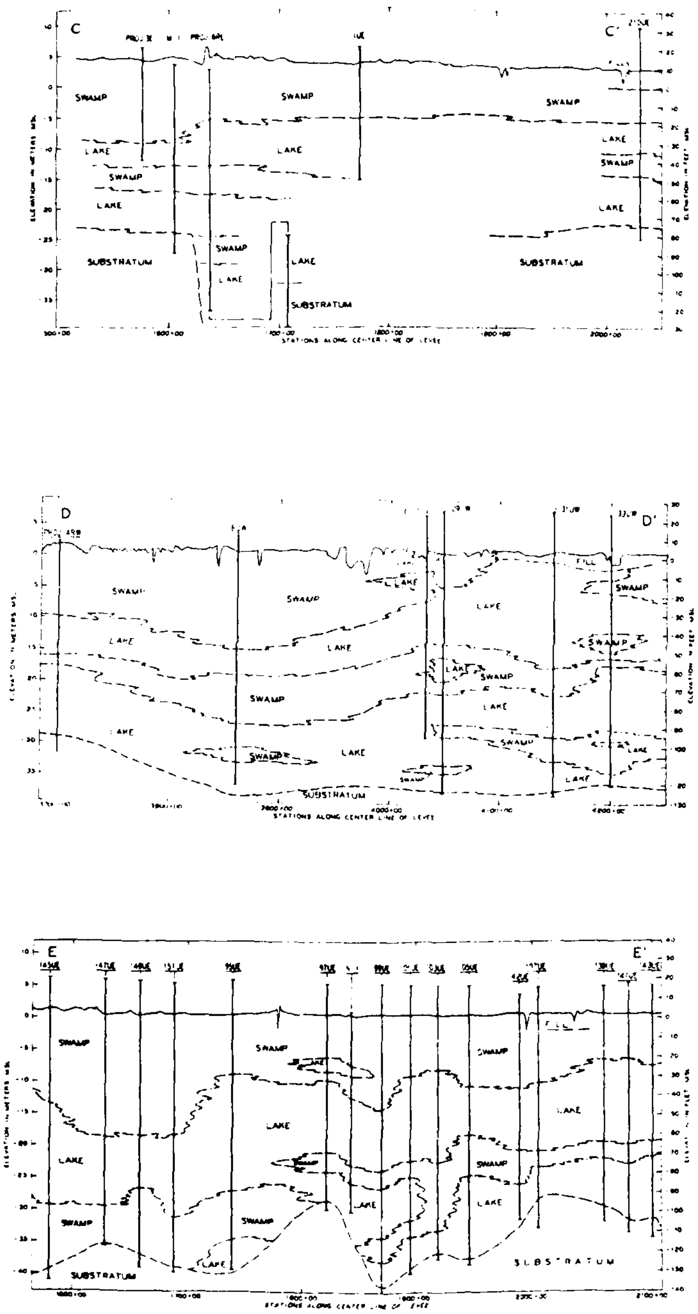


Figure 12. Geologic cross sections C-C', D-D', and E-E' of Atchafalaya Basin showing backswamp and lake environments (after Krinitzsky and Smith, 1969)



Geologic cross sections C-C', D-D', and E-E' of Atchafalaya Basin showing backswamp and lake environments (after Krinitzsky and Smith, 1969)

masked any evidence of this early system. Subsurface data from engineering borings drilled during the construction of I-10 across the northern portion of the basin support an early Maringouin- Mississippi course that has migrated laterally across the alluvial valley, perhaps in an east to west direction (May, 1983a and b). Additional subsurface exploration work is required before definitive statements about a pre-Teche system can be made.

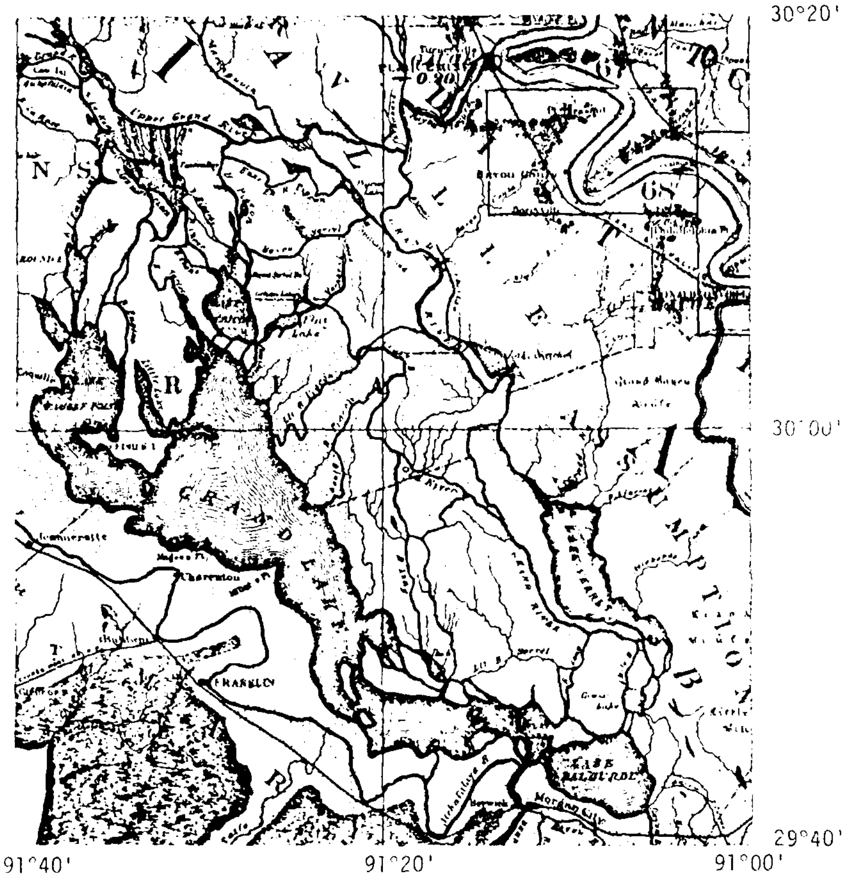
76. The oldest near-surface deposits in the Atchafalaya Basin are related to the former Teche-Mississippi course, active from approximately 5,800 to 3,500 years BP (Frazier, 1967). Sea level during this time was at or very near the present level. Generally, the upper 9.0 m (30 ft) of basin deposits is related to the Teche and later courses (see Table 2). Many current drainage patterns are probably related to the active Teche system, particularly from crevasse channels emptying into the interior basin region during flood flow periods. Abandonment of the Teche system, followed by growth of the Lafourche System, filling of Grand and Six Mile Lakes, and recent masking by lacustrine and lacustrine delta deposits have made interpretation and recognition of Teche distributary and crevasse channels in the Atchafalaya Basin difficult or impossible without use of dating techniques.

77. Late Holocene and Prehistoric geomorphic development. The present physiography of the Atchafalaya Basin is the result of a long chain of late Holocene and Historic events, both natural and man induced. The first major link in this chain of events occurred approximately 1,500 to 2,000 years BP with closure of the Atchafalaya Basin by the Lafourche deltaic network. Closure was accomplished when the Little Bayou Black-Bayou du Large distributary course intersected the former Mississippi-Teche course (Bayou Black) at Houma. Subsequent closure of the Atchafalaya Basin was responsible for development of the extensive lake system within the southern portion of the floodway. Surface drainage was denied an exit to the Gulf and began ponding behind the Teche alluvial ridge (natural levee of the Teche course). Growth of the lake system was further aided by local basin subsidence and wind-wave generated erosion. It is estimated that the lake system required at least several hundred years to develop, if not longer. Eventually, the ponded drainage became sufficiently high to overtop the natural levee on the north bank of the Teche course or used and enlarged former Teche crevasse

channels at Patterson and Morgan City. Drainage from the basin to the Gulf initially followed the old Bayou Teche- Black course southeast and into the Lafourche distributary Bayou du Large (see Plates 2, 3, and 45). Formation of the lower Atchafalaya River at Morgan City (see Plate 35) occurred by crevassing sometime after establishment of basin drainage through the Teche course, when flood flow from the Little Bayou Black and Bayou du Large distributary backed up drainage in the Bayou Teche-Black course.

78. Geomorphic mapping of the Atchafalaya Basin in this study indicates that the prehistoric limits of the southern system of lakes was not as extensive as defined earlier by Fisk (1952). The maximum up-basin extent of the prehistoric lake boundary is defined by Upper Grand River on the Lake Mongoulois Quadrangle (Plate 15). Historical maps (Darby, 1816; Hardee, 1871) define two large but discontinuous lakes just south of Upper Grand River: Lake Mongoulois and Lake Chicot (Plates 15 and 20, respectively). Immediately south of Lake Chicot a series of connecting lakes extended southeast to Morgan City (Lake Fausse Pointe, Grand, Six Mile, and Palourde). Archeological data examined during this study support this interpretation of the prehistoric lake limits. Numerous prehistoric cultural occupation sites are clustered along the paleoshoreline (McIntire, 1958 and data used during this study). Figure 13 defines the maximum up-basin extent of the interconnecting lake system.

79. The second major development in the chain of events leading to the modern basin occurred a little more than 500 years ago when the active Mississippi River meander loop known as Old River-Turnbull Island intersected Bayou DeGlaze and Lettsworth, a former Mississippi River course (Fisk, 1940). Intersection by the Mississippi River of the Bayou DeGlaze and Lettsworth course captured the Red River flow; the Red River was using the older abandoned Mississippi River course to empty into the present Mississippi River further to the south. Formation of the Atchafalaya River soon followed and required flood flow from the active Mississippi River to flow upstream in the former Bayou DeGlaze and Lettsworth course and crevasse the natural levee bordering the northern edge of the basin near Simmsport. Continued Mississippi River flow through the Simmsport crevasse soon established the Atchafalaya River and Basin as a Mississippi River distributary and modern Red River course.



Source: Index chart of the Mississippi River from mouth of Ohio River to the Gulf of Mexico...compiled from surveys between 1859 through 1884

Figure 13. Approximate prehistoric limits of Grand Lake

80. Speculation about an earlier Red River or ancestral Atchafalaya River course in the basin has been a subject of much controversy. Fisk (1940) concluded in a detailed geologic study of Rapides and Avoyelles Parishes that an earlier Red-Atchafalaya course in the basin was not possible. As partial evidence against an earlier Red-Atchafalaya course, Fisk cites an account by Humphreys and Abbott (1876) which summarizes a response to the controversy as follows:

> The opinion has been frequently expressed that Red River was not originally united to the Mississippi, but flowed to the sea separately in the channel now called the Atchafalaya, from which it was disconnected by the changes in the course of the Mississippi. This opinion is believed to be erroneous because the area of the greatest cross-section of the Atchafalaya, at the efflux from the Mississippi, is but little more than half that of Red River below the junction of Black River, and because the Atchafalaya has not the capacity to discharge much more than half the volume discharged by Red River in flood. If the Atchafalaya had been the channel of Red River, its subsequent connection with the Mississippi could not have diminshed its discharge of capacity, since the floods of the Mississippi are of much longer duration than those of Red River, and it is evident, from the very small slope of Red River above the mouth, that its rise and fall at that point could not have been decreased by a junction with the Mississippi....
>
> It therefore appears more probable that the Atchafalaya was a mere valley drain, discharging clear waters, until the Mississippi, by eroding its own bank, converted it into a waste-weir, when, becoming a muddy stream of increasing discharge, the Atchafalaya began to raise its bank....

81. Earlier Red River activity in the basin was limited to crevasse channels emptying into the basin when the Red River was occupying the Teche-Mississippi River course. Red River discharge to the Teche began sometime during the active Teche stage. The Red River entered the Teche course by way of Bayou Bouef, south of the Marksville Hills in the vicinity of Opelousas as shown in Figure 14 (after Fisk, 1952). The eventual shift of the Red River from the Teche course to the former Mississippi course of Bayou Deglaze and Lettesworth occurred during the early to middle part of the Mississippi-Lafourche stage. The Red River course shift occurred because of an obvious gradient advantage over the Teche outlet to the Gulf, the prograding Lafourche system blocked flow out of the Teche, forcing the Red River to seek a new course and discharge into the Mississippi River up-valley.

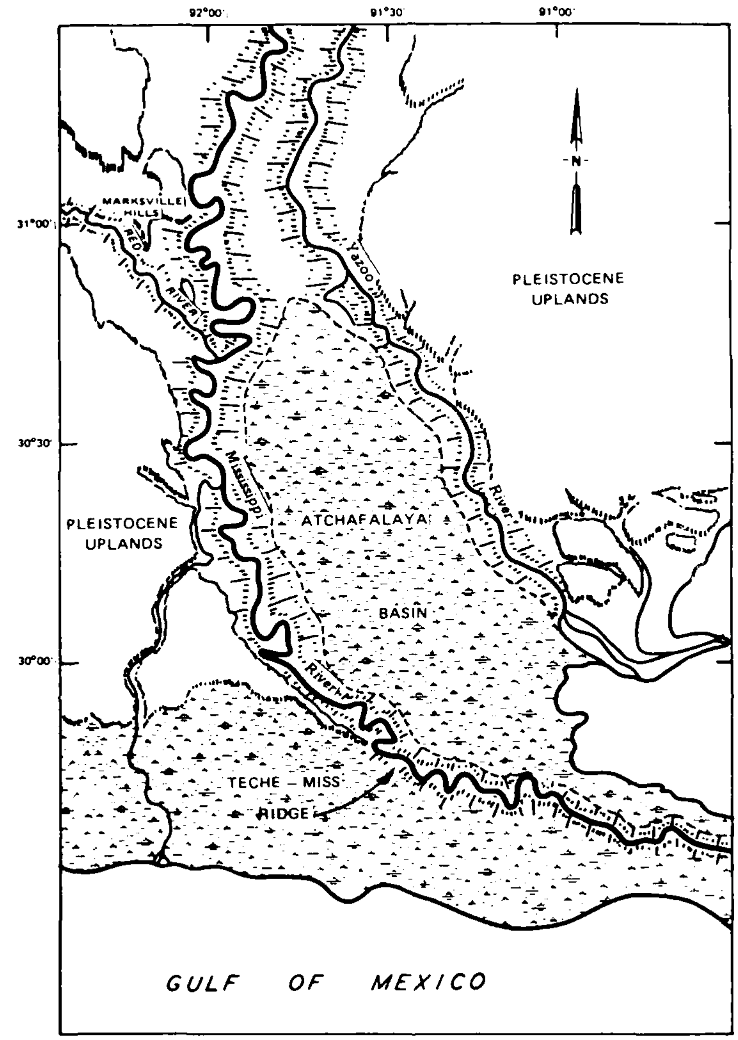


Figure 14. Atchafalaya Basin region and Red River course during Mississippi-Teche stage (after Fisk, 1952)

32. Historic. The third major link in the continuing chain of events leading to the evolution of the present physiography of the basin is man's historic activity in the region. Little physiographic change appears to have occurred within the basin or floodway between the birth of the modern Atchafalaya River and early occupation by European settlers in the early to mid 1800's. As Fisk (1952) noted when comparing early Louisiana state maps (Darby, 1816) with a much earlier map dated 1578 by Monk Ptolmey, who accompanied Desoto's expedition to the mouth of the Atchafalaya River in 1542, no substantial change appears to have occurred in the study region from the mid 1500's to before the turn of the present century.

33. Three major stages of human activity have occurred in the basin leading to the present physiography: (1) initial occupation by European settlers and development of agricultural, fishing, and timber resources; (2) development of major transportation networks into the basin interior (improved navigation for steamships and major railroad routes); and (3) development of the basin for a flood control program in response to the disastrous 1927 Mississippi River flood. Collectively, the following summary of events has formed the modern Atchafalaya Basin (Fisk, 1952; Gibson, 1982).

a. The completion of Shreves cutoff in 1831 divided the Atchafalaya River from primary Mississippi River flow, forming Old River and Turnbull Island cutoff.

b. The log raft on the Atchafalaya River was removed to accommodate steamship navigation between the Atchafalaya and Mississippi Rivers (timber removal began in 1839 and was eventually completed in 1861). Darby (1816) stated the following concerning the raft:

> The distance between the extremities of the raft is upwards of 20 miles, but the whole distance not being filled up by timber, the aggregate of the raft in length is not far from 10 miles....
> Ten miles of raft, multiplied by the width of the river generally, about ten chains or 220 yds, will give the following result: 35,848,000 superficial ft = 286,784,000 solid ft = 2,240,500 solid cords, allowing the timber 8 ft depth.

c. Private, state, and federal dredging of Old River was conducted between 1855 and 1940 to maintain a ship's navigation channel between the Atchafalaya and Mississippi Rivers.

d. Private agriculture interests leveed the upper segments of the Atchafalaya River to protect against increased flooding from larger volumes of Red River

and Mississippi River diversion; levee construction by 1910 extended along both sides of the Atchafalaya River to Krotz Springs and by 1937 reached its present limits.

e. The Atchafalaya Basin was designated a major floodway by 1928 Act of Congress following 1927 disastrous flood. By this act, the Atchafalaya Basin was to receive slightly less than 50 percent or approximately 41,600 cu. meters/sec (1,470,000 cfs) of a projected 86,700 cu. meters/sec (3,065,000 cfs) Mississippi River flood (Figure 15). The results of this congressional act produced the following general changes and/or flood control measures:

(1) Guide levees (present study boundaries) and navigation structures were constructed along the east and west flanks of the Atchafalaya Basin from Old River to Morgan City. The entire enclosed flood containment area measures approximately 4150 km^2 (1,600 sq miles) and was completed in the early 1950's.

(2) A shorter, more hydraulically efficient route to the Gulf was created by constructing a single main channel through the upper and middle basin regions, causing diversion of primary flow into Grand Lake and abandonment of drainage through Upper and Lower Grand Rivers. Channel dredging began in early 1930's and was completed in 1940's.

(3) Morganza Floodway was completed in the early 1950's to divert an additional 17,000 cu. meters/sec (600,000 cfs) into basin, approximately 20 river miles south of Old River.

(4) Wax Lake Outlet was completed in 1941 to divert 7,600 cu. meters/sec (270,000 cfs combined projected 41,600 cu. meters/sec (1,470,000 cfs) Morganza and Old River Mississippi flood-flow diversion with the remaining 1,200,000 to pass through lower the Atchafalaya River.

(5) Old River Control Structure was completed in 1963 to regulate flow into the basin at 30 percent of the Mississippi River discharge. The structure currently prevents capture of Mississippi River flow by the Atchafalaya because of the more favorable gradient advantage down the Atchafalaya Basin (Fisk, 1952).

84. Man's historic activity in the basin has significantly altered the region from a predominantly wetland to an increasingly terrestrial environment. The far reaching implications of the Atchafalaya River becoming the primary Mississippi River distributary are now only becoming evident and the implications just barely understood. Prior to man's activity, the study area was characterized by sluggish streams, swamps, and extensive lakes. At the present, this same region is characterized by extensive

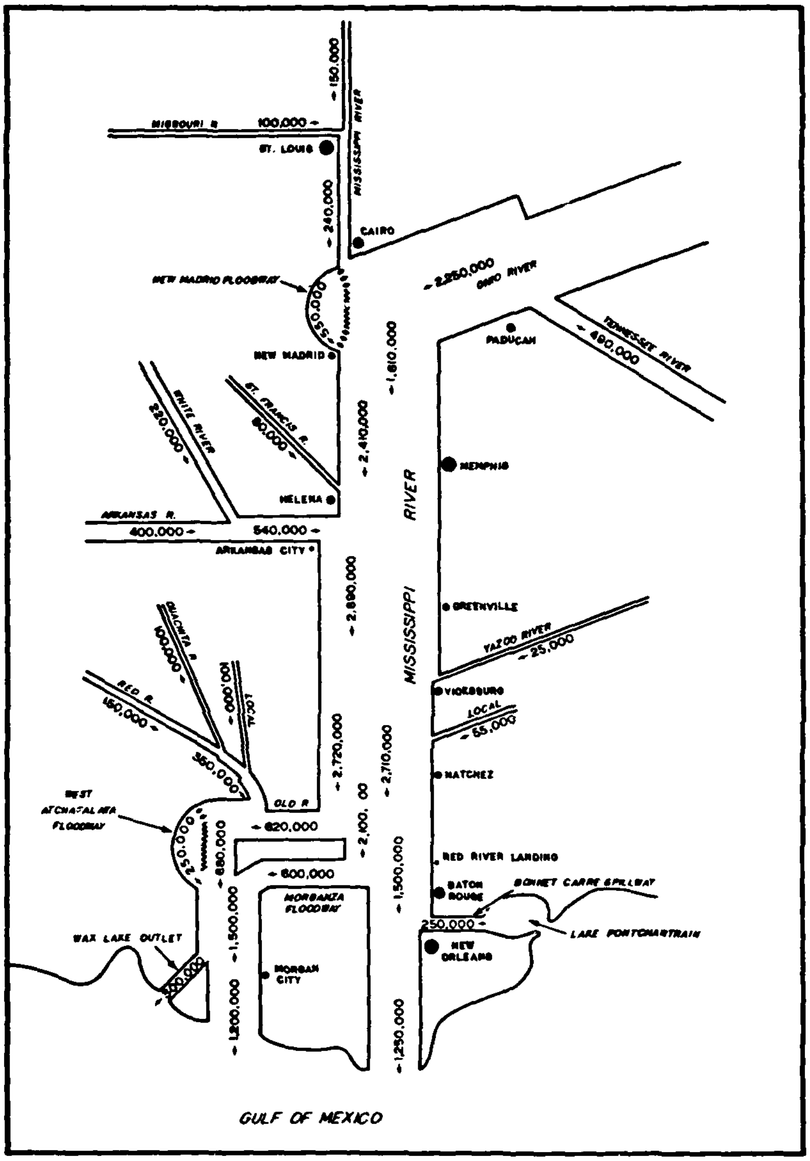


Figure 15. Dispersal route of projected 3,000,000 cfs flood as defined by 1928 Flood Control Act (MRC, 1951)

natural levees along numerous major channels, newly emergent land areas at the expense of a shrinking lake system, and a growing subaerial delta in Atchafalaya Bay. In examining the general aspects of recent historical change throughout the basin, the basin study area is divided into three distinct subregions: upper basin, middle basin, and lower basin regions. Included in this discussion is the Atchafalaya Bay area, a fourth major subregion experiencing dynamic change as a result of increased Mississippi River flow to the Lower Atchafalaya River and Wax Lake Outlets. Historically, the Atchafalaya Bay region has been characterized by eroding coastlines.

Upper basin

85. The area of the upper basin includes that portion of the Atchafalaya Basin north of the Upper Grand River (Plates 3-13). Throughout much of this area, the Atchafalaya River is bounded by flood-control levees. However, beginning in the central portion of the Maringouin NW Quadrangle (Plate 8), only the west bank of the Atchafalaya River is leveed. The west bank levee extends to the southern edge of the Butte La Rose Quadrangle (Plate 11). A direct consequence of the flood-control levees and increased flow have been active downcutting by the river into the topstratum as a result of channel confinement. Fisk (1952) noted that where the river had cut into the substratum, particularly in areas overlayed by a backswamp topstratum, active channel enlargement occurred by undercutting of the bank and eventual slumping or caving of the topstratum materials. Channel enlargement by undercutting and slumping is easily recognized on aerial photography and is as pronounced today as it was during the 1950's, as shown by the scalloped banklines on the Maringouin NW Quadrangle (Plate 8).

86. Intimately related to channel enlargement is the growth of point bar deposits. Point bar deposits in the upper basin are relatively minor deposits, generally historic in age, and related to increased channel flow and levee confinement. Fisk (1952) noted that point bars have smooth banklines and that the topstratum thickness controls channel enlargement or point bar formation.

87. A pronounced growth of natural levee deposits has and is occurring in the upper basin region due to an increased stage-discharge relationship on the Atchafalaya River from increased Mississippi River flow. An example of the rapid development of natural levee deposits that has occurred in the upper basin area is shown on the

Maringouin Quadrangle (Plate 9). Prior to 1935, the land surface in the northern half of the Maringouin Quadrangle was predominantly backswamp with typical ground elevations ranging from approximately 3.0 m (10 ft) to less than 4.5 m (15 ft) msl. Presently, the surface elevations for this same area range from 4.5 m (15 ft) to less than 6.1 m (20 ft), an average vertical growth of approximately 2.1 m (7 ft) from the deposition of broad vertical accretion deposits. In summary, the upper basin reflects recent, broad natural levee growth resulting from an increased Mississippi River discharge to the Atchafalaya River.

88. Associated with the broad natural levee development of the upper basin is the presence of numerous crevasse channels radiating from the Atchafalaya River and terminating in the lower backswamp areas that flank the trunk channel. Several large crevasses are delineated on the Butte La Rose Quadrangle (Plate 11). A large historic crevasse splay is delineated on the northeast corner of the Portage Quadrangle (Plate 7).

89. Another product of an increasing stage-discharge relationship is the numerous shallow interlevee depression and levee flank depression lakes. Formation of these lakes occurs during a major flood event when the natural levees are overtopped and water is trapped behind the levee following retreat of the flood. Evolution of these lakes can be traced over several dates of aerial photography and are generally short lived, between 10 and 15 years duration. Two examples of an interlevee depression lake are Lost Lake and Cow Island Lake on the Butte La Rose Quadrangle (Plate 11). Des Ourses Swamp Lake on the Maringouin NW (Plate 8), Maringouin (Plate 9), Butte La Rose (Plate 11), and Cow Bayou (Plate 12) Quadrangles is an example of a larger, shallow levee flank depression lake.

Middle basin

90. The area of the middle basin includes that portion of the basin study area between the Upper Grand River and the parish boundary separating St. Martin and Iberia Parishes (Plates 14-21), approximate northern boundary of southern basin lake system. The middle basin area is best described as a transition between the massive vertical or overbank growth of the upper basin, and the dynamic filling or lacustrine delta deposition in Grand and Six Mile Lakes in the lower basin. Generally, three major temporal stratigraphic components characterize this area: (1) gradual abandonment and filling of the

interconnecting distributary channels as flow increased and concentrated into a major master dredged channel; (2) rapid filling of low subaqueous areas, Lakes Chicot, Mongoulois, and Lake Round, by lacustrine delta deposition; and (3) a slight but noticeable vertical or overbank accretion component (natural levee) developing as the locus of overbank deposition begins its shift from the upper to middle basin. Contributing to lake filling and overbank deposition in the backswamp regions is the construction of service canals and petroleum pipelines. Canals and pipelines allow flood flow access into the interior basin backswamps and provide additional avenues for sedimentation. Examples of this type of situation are shown on the Jackass Bay Quadrangle (Plate 19).

91. Generally absent from the middle basin are point bar deposits and the broad natural levees associated with the upper basin. Instead, extensive backswamps characterized by sluggish relict and recent drainage networks are found throughout the middle basin. Natural levees along these sluggish backswamp channels are predominantly narrow or usually absent. More extensive natural levee development in the middle basin is confined to the active main channel.

Lower basin

92. The area of the lower basin includes that portion of the basin study area between the parish boundary separating St. Martin and Iberia parishes and extending south to Morgan City and the Teche Ridge (Plates 22-25, 28-30, and 34-35). The lower basin reflects the limits of Grand and Six Mile Lakes, and has undergone massive filling in a relatively short time. Of the three subdivisions of the Atchafalaya Basin, the lower basin has experienced the most dynamic change as the system of lakes has acted as a settling basin. Since the early 1900's, approximately 85 percent of the lower basin lake system has filled as shown in Figure 16 (after MRC, 1951; and Roberts, Adams, and Cunningham, 1980). Complete filling of Grand and Six Mile Lakes is likely by the year 2000. The prehistoric limits of Grand and Six Mile Lakes are defined by the geomorphic maps in Volume II and Figure 14.

93. The area in the lower basin between Grand and Six Mile Lakes and the East Atchafalaya Basin Protection levee is predominantly backswamp. These backswamps in this region are similar to backswamps in the middle basin and are characterized by

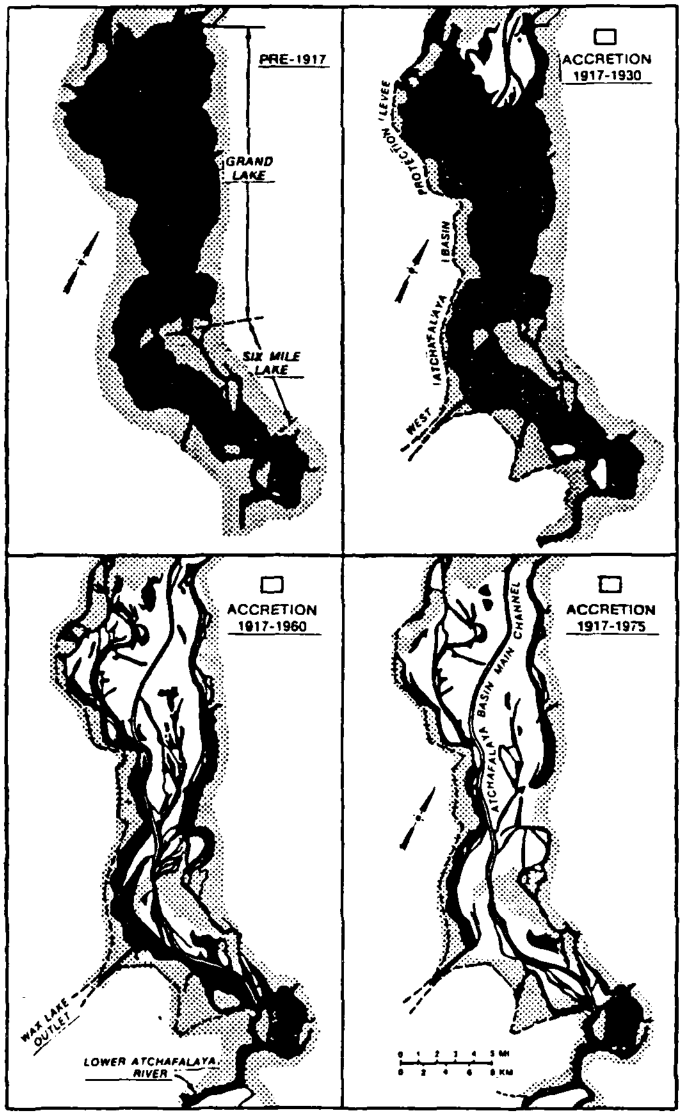


Figure 16. Filling of Grand and Six Mile Lakes (after MRC, 1951 and Roberts et al., 1980)

sluggish relict and historic drainage channels with narrow or often indistinguishable natural levees. Recent construction of petroleum service canals and pipelines has further modified preexisting drainage patterns. It is expected that the magnitude and frequency of deposition into the backswamps will gradually increase as vertical or overbank deposition becomes the dominant sedimentation process after complete filling of Grand and Six Mile Lakes.

94. The consequences of complete lake filling and its future implications must be considered. The Atachafalaya Basin is a collection of various interlocking components constituting a through-flowing fluvial/lacustrine system. The variables, discharge, gradient, channel morphometry, and sediment load are all adjusting or responding to historical changes. In the last 50 to 60 years, the lower lakes acted as a local base level, governing sedimentation processes and rates in the upper and middle basins. Presently, lacustrine delta filling of the lower lakes has significantly changed the local base level and drastically altered sedimentation processes and rates within the Atchafalaya Basin. Geomorphic mapping has defined the results of man's historic activities and the sedimentation responses for each area indicating that a second major component of deposition will sweep the basin. Already pronounced in the upper basin, vertical accretion will soon become the dominant sedimentation process throughout the middle and lower basins. Evidence of vertical accretion is well developed in the upper basin in the form of broad natural levees, crevasse channels and splays, and the beginning of a meandering Atchafalaya River.

Atchafalaya Bay

95. The Atchafalaya Bay area is associated with an eroding coastline (see Figure 1). Coastal land loss has been tentatively delineated by numerous workers and ranges from approximately 3 to 9 m (10 to 30 ft) per year (Morgan and Larimore, 1957; Gagliano and Van Beek, 1975; Roberts, Adams and Cunningham, 1980). Since the 1930's, increasing volumes of sediment have been transported into the bay area. Presently, two subaerial deltas of significant dimensions are growing at the mouth of the lower Atchafalaya River and Wax Lake Outlets (see Plates 39 and 43). Continued deltaic growth will eventually reverse the former trend of land loss. Deltas of the Lower Atchafalaya River and Wax Lake Outlets have been exposed subaerially since 1973 and 1976, respectively,

and have been growing at an increasing rate. Shlemon (1972) defined four phases of deltaic growth in the Atchafalaya Bay:

a. An initial phase characterized by flocculation of clay particles and subaqueous accretion at some distance from the source of active deposition (prodelta).

b. A secondary phase consisting of slow subaqueous growth, characterized by a slight coarsing upward of deposits as the delta progrades southward into the bay.

c. A third phase of subaerial growth and deltaic expansion, characterized by the deposition of sand-rich lenticular lobes.

d. A final phase (of deterioration) when the delta mouth progades into deeper waters (shelf edge) and wave erosion and local compaction reworks the distal edges of the deltaic lobes.

96. The first phase of deltaic growth in the four part developmental chronology of Atchafalaya Bay began about 1952 with the slow subaqueous accumulation of prodelta clays in Atchafalaya Bay. The initial phase lasted approximately 10 years until delta front deposition by an increasingly coarse facies became more pronounced. At the close of the initial phase, sedimentation from the Lower Atchafalaya River in the eastern bay area had blanketed approximately 122 km^2 (47 sq miles) of the bay bottom with 0.33 m (1 ft) of clay (Shlemon, 1972). Prior to 1952, sedimentation was confined to the basin in Grand and Six Mile Lakes. Water depth in Atchafalaya Bay before 1952 generally averaged less than 2.1 m (7 ft) and was fairly constant as indicated by comparisons with earlier bathymetric surveys (Thompson, 1951; Shlemon, 1972).

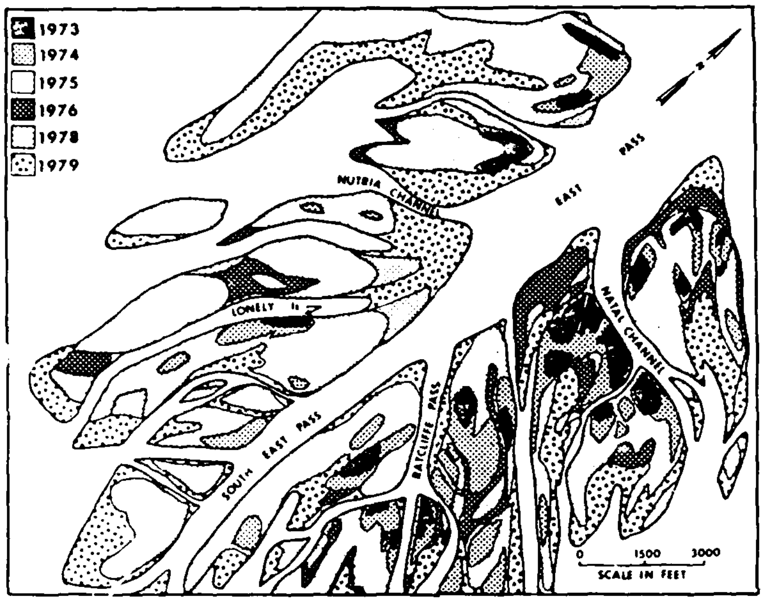
97. Dynamic change began occurring by 1962 in the eastern Atchafalaya Bay because of the near filling of Grand and Six Mile Lakes. The second phase of deltaic growth from 1962 to 1972 was characterized by rapid subaqueous growth in the bay and increased deposition of coarse sediments. Van Heerden and Roberts (1980a) described the second phase of deposition as consisting of a distal bar and subaqueous bar stage. Bifurcating subaqueous distributary channels were developed in Atchafalaya Bay during the subaqueous bar stage.

98. The third phase of deltaic development was defined initially by formation of several small subaerial islands near the mouth of the Lower Atchafalaya River in 1973. Formation of subaerial islands at the mouth of the Wax Lake Outlet began in 1976. A

major shift in deposition occurred during the third phase from an increasingly clay-rich to a sand-rich facies as the delta prograded southward. Active deltaic progradation has been correlated to major Mississippi-Atchafalaya River flood flow discharges as shown in Figure 17 (Van Heerden and Roberts, 1980a). Flooding and maximum deltaic growth occurred during the years 1974, 1975, and 1979. Between flooding events, erosion by wave action partially reworks and destroys the subaerial delta lobes. Maximum erosion occurs during the late fall and early winter as cyclonic dominated weather fronts increase wave energy. Southerly winds preceding an active cold front cause bay water levels to rise. Passage of the cold cyclonic front causes a northerly windshift in which water is rapidly forced from the bay area, redistributing sediment (Wells, Chinburg, and Coleman, 1984). In summary, the third phase of prolonged deltaic growth in Atchafalaya Bay is characterized by yearly cyclic progradation, followed by sediment reworking and redistribution.

99. Projections about the time of complete subaerial deltaic growth in Atchafalaya Bay vary considerably and range from as early as 1990 to 2030 (Shlemon, 1972; Wells, Chinburg, and Coleman, 1984). The latest approximation of bay filling, a generic analysis by Wells, Chinburg, and Coleman (1984), is shown in Figure 18 and consists of three growth projections based on Atchafalaya River discharge. Average or normal discharge would produce 208 km^2 (80 sq miles) new land and above or below average discharges would produce 337 km^2 (130 sq miles) and 150 km^2 (60 sq miles) of new land, respectively. These predictions are estimates based on current growth trends and do not account for major shifts in locus of sedimentation, simultaneous deterioration of the growing delta, or projected activities of man. Included in Figure 18 are four major distributary courses estimated to remain open during the course of the filling process: East Pass (No. 1), Polledieux Channel (No. 2), Log Channel (No. 3), and Amerada Hess Channel (No. 4).

100. Estimation about the time of Shlemon's (1972) fourth or erosional phase of deltaic development for Atchafalaya Bay is speculative. Initiation of the third phase of deltaic growth has only just started, and as present studies indicate, the deltaic variables and their implications are yet only barely understood (Atchafalaya River discharge, future weather patterns, subsidence rates, modifications by man, etc.) Before the fourth



Cummulative Totals

Year	Area mi^2	Area km^2
1973	0.22	0.57
1974	0.69	1.75
1975	3.06	7.83
1976	3.23	8.28
1977	—	—
1978	3.44	8.81
1979	4.56	11.68

Figure 17. Subareal deposition for a portion of East Pass area of lower Atchafalaya River delta (van Heerden and Roberts, 1980)

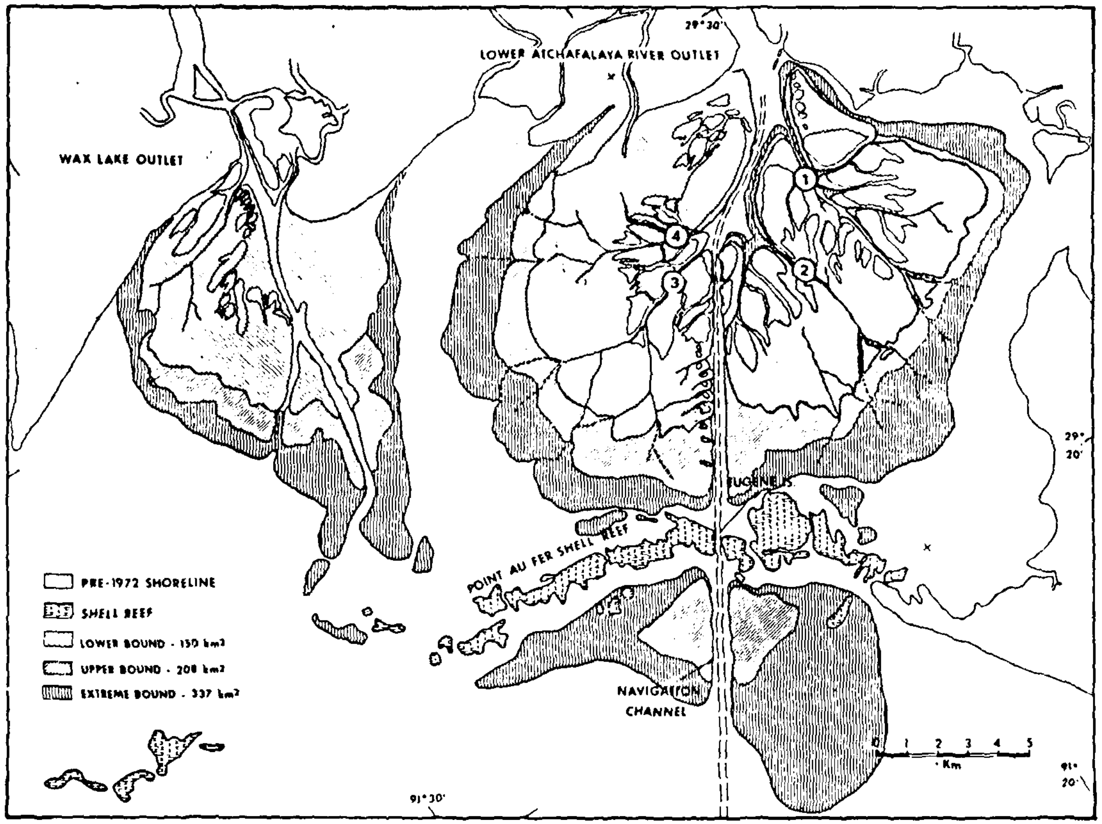


Figure 18. Configuration of subaerial land growth in Atchafalaya Bay in year 2030 assuming below average, average, and above average discharges (Wells, Chinburg, and Coleman, 1984,

(deterioration) phase of development can be initiated, the third or growth stage must reach its termination.

Geomorphic Development of the Terrebonne Marsh

Physiography

101. The study area designated as the Terrebonne Marsh covers an area of approximately 2,000 km^2 (720 sq. miles) (Figure 1). Terrebonne Marsh is bounded by the former Teche-Mississippi course on the north, Bayou du Large on the east, Lower Atchafalaya River on the west, and the Gulf of Mexico on the south. The most prominent physiographic feature of this area is the vast expanse of fresh, brackish, and salt marshes. Natural levees, inland swamp, abandoned distributaries, tidal channels, and shallow lakes comprise the remainder of the surface features.

Geomorphic development

102. Two separate delta lobes have prograded into Terrebonne Marsh within approximately the last 4,500 years. The Teche-Mississippi was actively depositing sediment in Terrebonne Marsh from approximately 4,500 to 3,500 years BP. This time interval is substantiated by radiocarbon dates from samples taken beneath the natural levee flanks of some of the major Teche distributaries and by dates published in previous works (Frazier, 1967; McFarlan, 1961). Bayou Black, the trunk stream of the Teche-Mississippi, and major distributaries such as Bayou Penchant, Bayou Cocodrie, Bayou Piquant, Little Horn Bayou, and Carencro Bayou all trend southeast, indicative of the direction of delta growth (Figure 19). The Red River also occupied the Teche course down to Houma, Louisiana. The exact time interval of Teche occupation by the Red River is not known, but it ended sometime between early and middle Lafourche when the Lafourche system caused a reversal of flow in the Teche course. The branching pattern displayed by many of the Teche distributary channels indicates that a large portion of the Teche delta prograded into open water. Examples of this branching pattern can be found on Plates 41-43. Two idealized sections across distributary channels illustrate the common sequences of depositional environments encountered in Terrebonne Marsh (Figures 20a and 20b). Figure 20a represents progradation of a distributary into an open

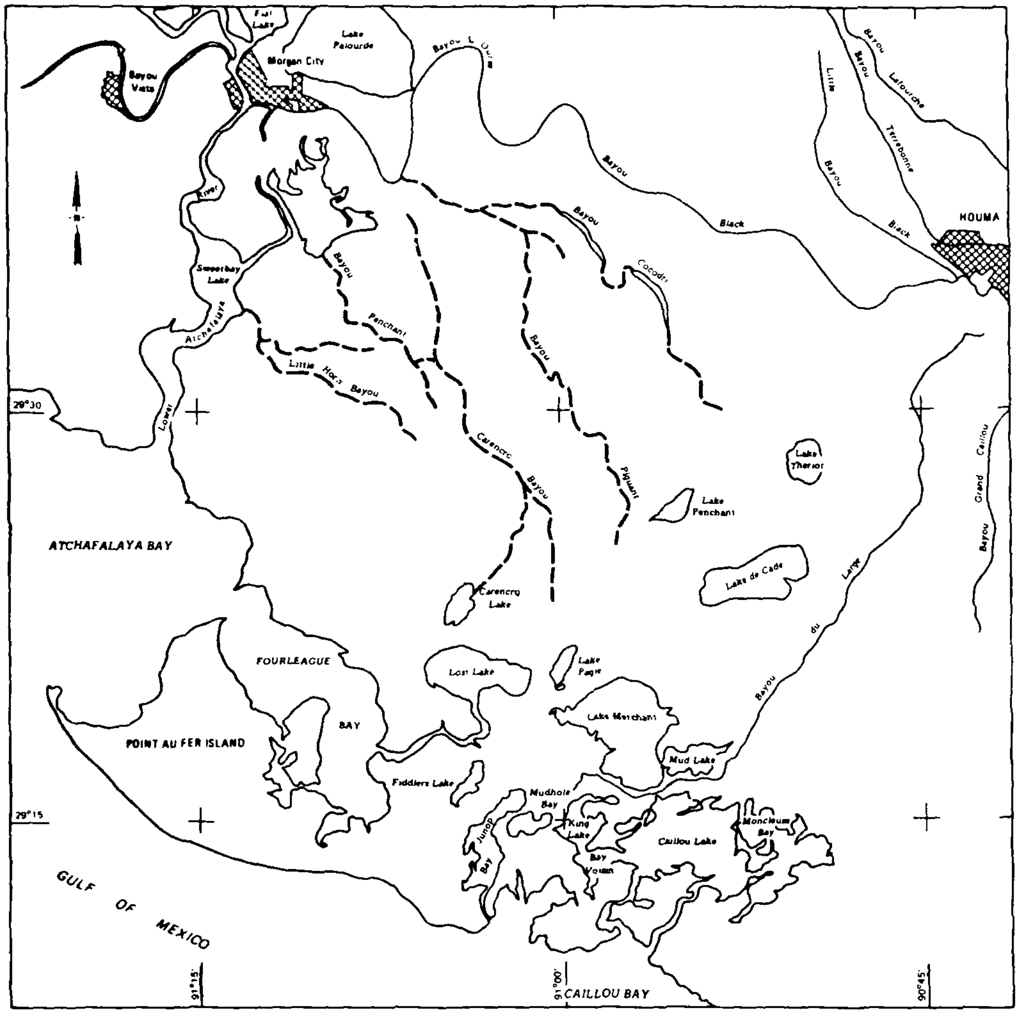
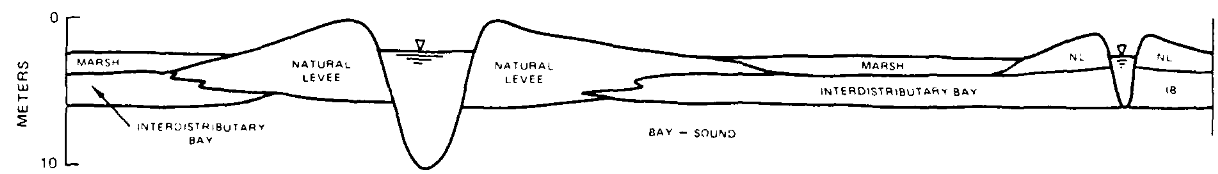
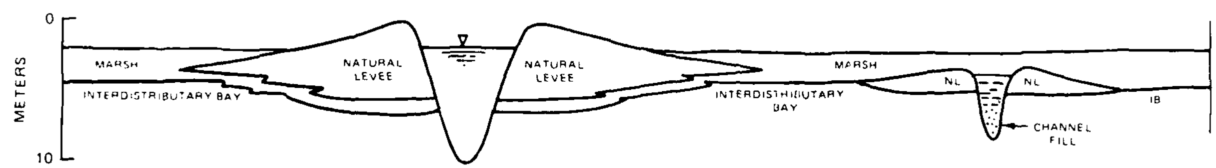


Figure 19. Dominant southeast trending Teche distributaries in Terrebonne Marsh



a. PROGRADATION OF A DISTRIBUTARY INTO AN OPEN-WATER SETTLING.



b. PROGRADATION OF A DISTRIBUTARY INTO A MARSH ENVIRONMENT.

Figure 20. Idealized sections depicting typical sequences of depositional environments in Terrebonne Marsh

water setting resulting in deposition of natural levee directly over interdistributary deposits. Figure 20b depicts the progradation of a distributary into a marsh environment established on top of interdistributary deposits. Figure 21 is a photograph of a vibracore representative of this vertical relationship. A biostratigraphic analysis of the cores taken in Terrebonne Marsh revealed that the major biogenic components were foraminifera common to estuarine environments, reinforcing the theory of delta progradation into open water. As long as the Teche-Mississippi system supplied sediment, shallow water areas were filled by interdistributary deposits forming mudflats. As the mudflats prograded seaward, they were colonized by coastal vegetation, creating a broad expanse of coastal marshlands.

103. Approximately 3,500 years BP, the Teche-Mississippi shifted eastward and started building the St. Bernard delta complex. Subsidence and reworking of the Teche delta became the dominant processes acting in Terrebonne Marsh. Much of the original shoreline was submerged beneath Gulf waters or was reworked by waves and became part of the transgressive shoreline. A possible beach ridge located on the Lake Penchant quadrangle (Plate 49) most likely marks the position of the transgressive shoreline after abandonment and reworking of the Teche lobe. McIntire (1958) mapped this beach ridge over a much larger area than is shown on the Lake Penchant Quadrangle, but the western half of this feature could not be identified from aerial photos or shallow borings made during this investigation. More boring data would be required to locate the limits of this possible beach trend.

104. The initial Lafourche lobe prograded into Terrebonne Marsh approximately 2,000 years BP. Bayou Lafourche, the trunk stream of the Lafourche system, is located north of the study area. However, several major Lafourche distributaries, coupled with reoccupation of the drowned distal end of Bayou Teche (former Teche-Mississippi course), allowed a large volume of sediment to enter the Terrebonne Marsh. Little Bayou Black, Bayou du Large, Mauvais Bois, and Marmande Ridge represent distributary channels of the Lafourche-Mississippi that prograded into Terrebonne Marsh (see Plate 3). The obvious decrease in levee size from Houma toward Gisbon (east to west) illustrates well that the Lafourche flowed back up the abandoned Teche-Mississippi course. This reversal of flow forced the Red River to back up near Morgan City where it

Figure 21. Vibracore G-6A containing sequence of environments depicted in Figure 20b, zone A is marsh, B is natural levee, C is marsh, and D is interdistributary bay

joined the flow of the Lower Atchafalaya River and Bayou Shaffer. Dates obtained from peats beneath the natural levees of some of the Lafourche distributaries indicate that the Lafourche system was active in Terrebonne Marsh from approximately 2,000 to 1,000 years BP. Progradation of the Lafourche delta in Terrebonne Marsh occurred in a south and southwesterly direction as seen from the orientation of the major distributary channels (Figure 22 and Plate 3). The branching pattern of these distributaries, like those of the Teche-Mississippi, indicates that a large portion of the Lafourche delta also prograded into a shallow water setting, probably estuarine in nature. A large portion of this open water represented the drowned distal portion of the Teche lobe. The Lafourche sediments prograded into this estuarine area, burying previously deposited Teche sediments. A detailed biostratigraphic analysis of a deep boring drilled through the flank of the Bayou du Large natural levee (BDL-2) contained a large assemblage of foraminifera associated with estuarine and shallow marine environments. As long as the Lafourche system supplied sediment, shallow water areas were filled by interdistributary deposits forming mudflats which were colonized by coastal vegetation creating marshlands. The same vertical sequences of depositional environments found in the Teche delta are found in the Lafourche delta in Terrebonne Marsh (Figures 20a and 20b). Figure 11 shows the proposed position of the Teche and Lafourche delta lobes in Terrebonne Marsh.

105. Approximately 1,000 years BP, the locus of Lafourche deposition shifted eastward out of Terrebonne Marsh. Since that time, there has been no appreciable deposition occurring in Terrebonne Marsh except on the extreme western border where the Atchafalaya River supplies a small amount of sediment to the marshes. Subsidence and reworking of the abandoned deltaic deposits have become the dominant processes in Terrebonne Marsh. The western half of Terrebonne Marsh is more stable with respect to subsidence than the eastern half due primarily to the fact that the compaction rate is much greater in younger sediments (Lafourche) than in older sediments (Teche). The relatively high rate of subsidence of Lafourche sediments in eastern Terrebonne Marsh is largely responsible for the accelerated rate of land loss in this part of the study area. In the western part of Terrebonne Marsh, land loss is much less due to relatively lower rates of subsidence and a shallow Pleistocene surface in the vicinity of Point Au Fer.

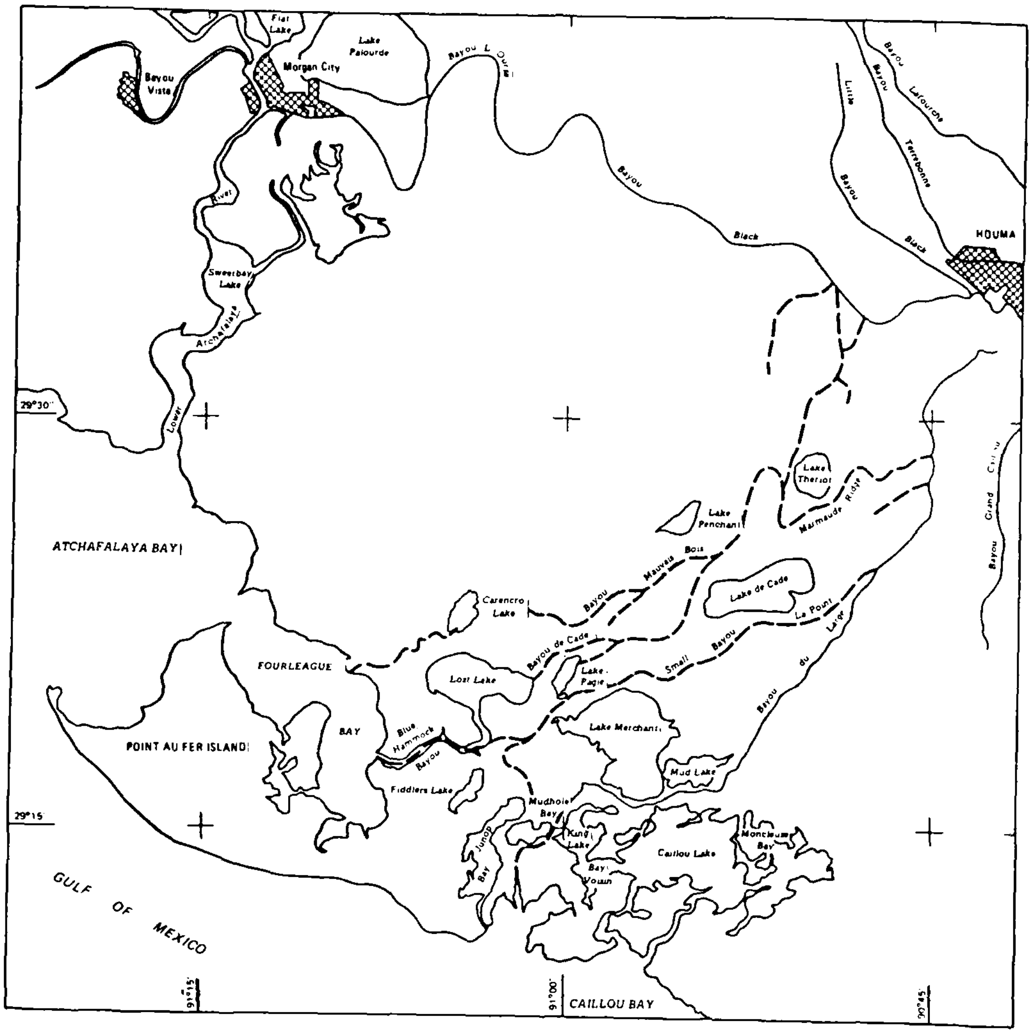


Figure 22. Dominant southwest trending Lafourche distributaries in Terrebonne Marsh

Geomorphic Development of the Area West and the Delta

Phy iography

106. Area West and the Delta are located in the western portion of the deltaic plain between the Lower Atchafalaya River on the east, Bayou Cypremort on the west, and the Teche Ridge on the north (Figure 1). The most prominent physiographic feature in Area West and the Delta is marsh, which rarely exceeds 0.3 to 0.6 m (1 to 2 ft) in elevation. Natural levees, distributary channels, inland swamp, minor tidal channels, Cote Blanche Salt Dome, Belle Isle Salt Dome, the Prairie Surface (Pleistocene in age), and small lakes and ponds account for the remainder of surface features.

Geomorphic development

107. Area West and the Delta have been occupied by two major Mississippi River deltas in the last 8,000 years (Weinstein and Gagliano, 1985). The oldest delta identified in the study areas is the Maringouin which was active between approximately 8,000 and 6,000 BP during a temporary stillstand of sea level (Frazier, 1967). Four distinct Maringouin courses have been postulated by Van Lopik (1955) and Kearns (1985). They are North Bend, Clausen-Possum Point, Sale course 3, and Sale course 4 (Figure 23). Van Lopik (1955) states that broad, marsh covered natural levees at the point of origin of North Bend, Clausen-Possum Point, and Sale course 3 are too large to represent minor distributaries and probably reflect major courses of a buried system. Kearns (1985), using augers and vibracores, has penetrated natural levee and channel deposits thought to be associated with these three courses plus the Sale course 4, providing further evidence of their existence. Trinity and Tiger shoals located off the present shoreline probably represent remnants of the Maringouin delta. Only Bayou Sale (course 3) and a small portion of North Bend (course 2) are distinguishable at the surface on aerial photographs and were mapped (Plates 33 and 38). Acceptance of a Maringouin system demands the extension of Bayou Sale (course 3) north of the Teche Ridge. Van Lopik (1955) states that Cathcart (1819) mapped a small bayou running northeastward from the Teche Ridge which is probably the present Yellow Bayou. Cathcart found a shell midden along this bayou which might suggest that Yellow Bayou was a much more important stream at one time. Van Lopik (1955) also mentions that Bayou Sale (course 3) branched from the Teche on the

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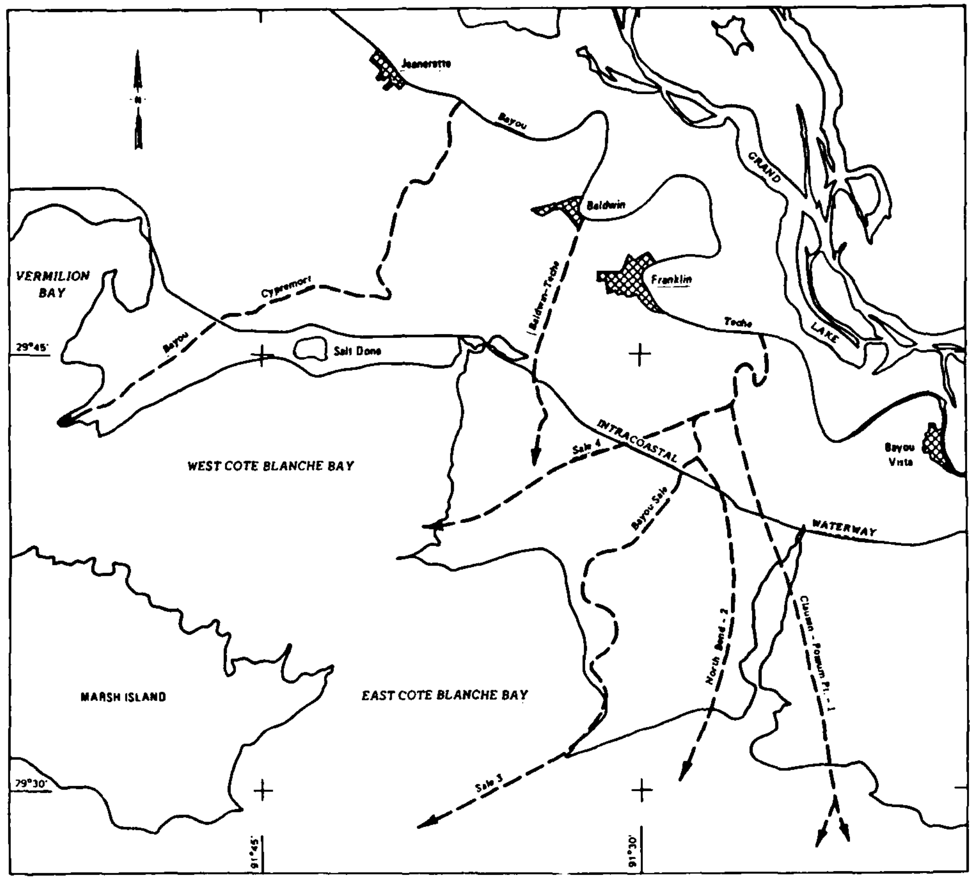

Figure 23. Major courses and distributaries of the Maringouin and Teche systems in Area West and the Delta (after Van Lopik, 1955 and Kearns, 1985)

inside of a bend which is possibly indicative of a near surface northeast-southwest trend in the junction area. Normal crevasse channels which give rise to distributaries of any importance are invariably formed on the outside of the bends. However, evidence of a continuation of the Sale course north of the Teche Ridge is not sufficient to place the course on a map. Recent deposition from the Atchafalaya and man's activities in the area have made any identification of the proposed extension of the Sale course impossible during this investigation. The transgression that followed deposition of the Maringouin delta caused reworking of the sediments forming thin sand sheets and barrier bars (Frazier, 1967). While sea level was rising the Mississippi River continued to flow down the western side of the alluvial valley, but apparently no major delta was built (Weinstein and Gagliano, 1985).

108. Progradation of the initial lobe of the Teche delta into Area West and the Delta is considered to be the next major depositional event after the Maringouin. The Teche system was actively depositing sediment in Area West and the Delta from approximately 5,800 to 4,000 years BP (Frazier, 1967). Bayous Sale and Cypremort served as the major distributaries of the Teche system during this cycle of delta growth (Van Lopik, 1955) (Plates 25, 33, and 38). Kearns (1985) has mapped another possible Teche distributary shown as Baldwin- Teche in Figure 23 using subsurface data. Van Lopik (1955) states that there is an apparent extension of Bayou Cypremort to the north of the Teche Ridge, but no evidence of this could be found during this investigation.

109. Information on the depositional environments into which the Maringouin and Teche delta systems prograded was obtained from a detailed stratigraphic analysis of this area by Kearns (1985). Kearns' data suggest that the Maringouin system prograded into a poorly drained swamp environment (inland facies). Seaward, this swamp environment most likely graded into a marsh environment (coastal facies). Once the Maringouin system was abandoned, subsidence and rising sea level caused the coastal facies (marsh) to transgress landward over the inland facies (swamp). The marsh environment was eventually partially inundated forming bays and small lakes. When the Teche system entered Area West and the Delta, it deposited sediments into this shallow water setting. The water bodies were filled to sea level producing mudflats and finally marsh. The elevation of these marshes has been able to keep pace with subsidence and sea level rise

up to the present. This marsh surface has remained relatively stable for approximately the last 3,000 years due to the existence of the underlying shallow Pleistocene prairie surface.

110. Since 1950, an increasing amount of sediment has reached the Delta and the eastern part of Area West from the Lower Atchafalaya River and Wax Lake Outlet. As previously stated, a subaerial phase of delta growth is occurring in Atchafalaya Bay (Plates 39 and 46).

PART IV: ARCHEOLOGICAL SIGNIFICANCE OF REGIONAL GEOMORPHIC DEVELOPMENT

Introduction

111. A primary objective of the geomorphic investigation of the Atchafalaya Basin, Terrebonne Marsh, and adjacent areas was to determine the significance of the geomorphic evolution of the region to locate and evaluate cultural resources. In the following paragraphs, existing archeological data are examined in a geomorphological context. The product of this examination combined with other data and conclusions of this investigation should be of substantial value to future cultural resource surveys in the study areas in a number of ways including the provision of:

a. Geomorphological information which will be of use in predicting site occurrence and extent.

b. Guidance for the location of areas which are likely to contain buried sites.

c. Guidance for the location of areas which are likely to contain sites of specific ages or cultural components.

d. Geomorphological information which will be helpful in predicting the probability of site destruction by natural geomorphic processes.

e. A landscape/landform classification and delineation necessary to establish site-landscape/landform associations.

f. Paleoenvironmental data critical to the evaluation of the cultural resources of a site or region.

112. In the previous part, a geomorphological foundation has been developed defining the spatial and temporal distribution of geomorphic environments and processes in the study areas. The use of the geomorphological data and conclusions of this investigation in the development of a through f above are discussed below.

Prediction of Site Occurrence

113. Most archeologists that have a modest amount of experience in conducting cultural resource surveys in alluvial and coastal plains have developed "intuition" regarding the probable occurrence of archeological sites in a region. Alluvial plains, natural levees, point bar ridges, and low terrace escarpments are generally considered to be preferred locations for site establishment by prehistoric cultures. In coastal plains, natural levees of distributary channels, beach ridges, and salt domes (Gulf Coast) appear to be likely environments for site occurrence. The apparent reasons for preferential selection of these specific alluvial and coastal environments include: (1) the selection of areas of optimum soil drainage, areas of permeable, slightly sloping soils; (2) the availability of faunal, floral, lithic, and natural resources, especially specific resources such as preferred lithic materials and aquatic environments; (3) proximity to transportation routes, and (4) protection from natural hazards (i.e., floods, hurricane surges, etc.). One of the values of the geomorphological reconstruction and mapping of a region is the use of geomorphological data in the definition of environmental availability during various cultural periods.

114. Associations between geomorphic environments and the occurrence of archeological sites by study areas in the region were investigated. All site records for the region available from the files of the state Historic Preservation office and the US Army Engineer District, New Orleans were reviewed. Of the 350 site records reviewed, 177 sites were located with sufficient accuracy to be used in the analysis. These sites were plotted on overlays to be placed on the geomorphic map. Table 3 is a summary of site occurrence by geomorphic environment and study area. Appendix C presents a listing of all sites examined. Specific site locations are not included due to their sensativity.

115. Sixty-five sites were plotted in the Atchafalaya Basin. The largest number of sites (22) occurred on natural levees of distributary channels. As expected, sites were also frequent on the natural levees of the Teche-Mississippi main channel which slope northward into the basin. Of particular significance, however, is the distinct clustering of sites along the paleo- shorelines of Grand and Six Mile Lakes in the Lower Atchafalaya

Basin. The shorelines of broad shallow lakes in the basin were obviously important locations to various prehistoric cultures of the region. The occurrence of archeological sites along the paleo-shorelines substantiates the interpretation that the lakes were relatively stable prior to the rapid influx of sediment during the last 80 to 100 years.

116. Site distribution in the Terrebonne Marsh is not surprisingly clustered around the major distributaries of the Teche and Lafourche deltaic complexes. The main Teche-Mississippi channel also appears to have been a major cultural focus in the Terrebonne Marsh as in the Atchafalaya Basin. The greater number of sites on the natural levees of the Teche and Lafourche distributaries than on the main Teche course is most likely a function of the larger expanse of area covered by natural levees of the two distributary networks. Considering the limited distribution of abandoned beach ridges in the Terrebonne Marsh, the occurrence of five sites in this geomorphic environment is significant. Field observation of sites on the abandoned beach ridge revealed that the sites were extensive along the trend of the beach, indicating that this environment was important to prehistoric cultures in the Terrebonne Marsh. The three sites mapped on bay shores are likely the result of reworking of archeological artifacts from other geomorphic environments or older bay shores.

117. Only nine sites were plotted in the Delta area. Three sites are located on the natural levees of major Teche distributaries, as seen in other study areas. Four sites were mapped in the fresh marsh. The occurrence of these four marsh sites underscores the interpretation of the marsh in the Delta area being older and more stable than the Terrebonne Marsh. Also supporting this interpretation is the occurrence of two sites adjacent to tidal channels in the delta, which, like the marsh, appears to be older and more stable than tidal channels in the Terrebonne Marsh.

118. Twenty-four sites were plotted in the Area West. Almost half of the sites is located on natural levees of the early Teche distributaries, a pattern which is evident throughout the coastal plain. Predictably, sites are also clustered around salt domes. Three sites are associated with the shore of West Cote Blanche Bay. These three sites are most likely accumulations of wave washed materials from other areas.

119. The site-geomorphic environment associations outlined in Table 2 must be considered in terms of the manner in which cultural resource surveys have been

conducted in the area. Clustering of sites on natural levees is both an artifact of environmental preference and the concentration of surveys on natural levees where sites can be more readily delineated. A similar statement may be made for abandoned beach ridges and bay shores which were often the focus of intense surveys. An additional factor which must be considered is the dynamic nature of the geomorphic evolution of the study areas. The present geomorphic environment of site location may not be the environment of the site location during site occupation. Geomorphic environments listed in Table 3 are considered to be the geomorphic environment at the time of site occupation (some sites listed as occurring on natural levees of Teche and Lafourche distributaries are presently in fresh marsh and inland swamps).

Buried Sites

120. The location of buried sites is of paramount importance during cultural resource surveys. Buried sites, unlike surface sites, are more likely to be less disturbed from their original provenance, and therefore represent a valuable resource to the evaluation and analysis of prehistoric cultural resources of a region. Location of buried sites requires a knowledge of the geomorphic processes of a region which are responsible for site burial and a knowledge of the geomorphic evolution of the region.

121. Depositional processes in alluvial and coastal plains can be classed into vertical and lateral accretion deposits. Vertical accretion buries sites, lateral accretion usually destroys them. Vertical accretion processes in the Atchafalaya Basin include deposition by natural levees and crevasse splays and sedimentation in backswamps and lacustrine environments. In the coastal plain, vertical accretion occurs by natural levee growth and sedimentation in inland swamps and interdistributary bays and lakes and subsidence of levees and growth of marsh over them. Lateral accretion processes will be discussed under the heading "prediction of site destruction."

122. An important geomorphic phenomenon which is occurring throughout all of the study areas is the burial of all but the crests of the natural levees of distributaries. In the Atchafalaya Basin, levee flank burial is the product of basin-wide sedimentation. As previously stated, a wave of vertical accretion is progressing down-basin throughout

the Atchafalaya Basin. As lacustrine areas become filled, more sediment is finding its way back into the backswamp and natural levee flanks behind the main channel of the Atchafalaya River. Sites which occur on these surfaces are being buried by the progressive sedimentary filling of the basin. Subsurface investigations described previously that the upper 28 to 38 m (90 to 120 ft) of sediment in the Atchafalaya Basin is composed of alternating strata deposited in lacustrine and paludal (swamp) environments (Figures 5, 6, and 12). Radiocarbon dates of these strata indicate that the cyclic deposition of lacustrine and paludal sediments has occurred throughout the Holocene period. Encased within the Holocene stratigraphy of the Atchafalaya Basin are occasional distributary channels not identified in Figures 5, 6, and 12 due to their limited lateral extent. The distribution of known archeological sites in the basin (Table 3) indicates that natural levees of distributary channels and lake shores were preferred environments of prehistoric cultures. Therefore, it is logical to expect the occurrence of archeological sites in association with these buried geomorphic environments in the Atchafalaya Basin. The primary occurrence of sites of the later cultural components (Plaquemine-Mississippian and Coles Creek) supports the interpretation that older sites are most likely buried within the vertical accretion deposits of the Atchafalaya Basin.

123. Site burial in the Terrebonne Marsh, Delta, and Area West is primarily the result of the subsidence of natural levees and beach ridges beneath the marsh. Figure 2 illustrates the cycle of levee growth, abandonment, and burial in the marsh. Many of the Teche and Lafourche distributaries in the Terrebonne Marsh, Delta, and Area West are in stage b, when only the natural levee crests are visible above the swamp and marsh. Some early Teche and Maringouin distributaries are now completely buried, especially in the Area West, Delta, and western Terrebonne Marsh. Maringouin, Teche, and Lafourche distributaries also dip into the subsurface southward as their deltaic lobes have subsided under the encroaching Gulf of Mexico.

124. Investigations of buried sites should be concentrated along the flanks of the natural levees of distributaries and the paleo-shorelines of Grand and Six Mile Lakes in the Atchafalaya Basin, as identified on the geomorphic maps. In the Terrebonne Marsh, Delta, and Area West, buried sites will occur on the buried flanks of natural levees and beach ridges.

Sites of Specific Ages and Cultural Components

125. Dynamic geomorphic processes in the study area such as progressive sedimentation and erosion (by various processes) and subsidence have resulted in various cycles of landscape evolution. In the basin, the dominant landscape evolution cycle consists of an increase in the percentage of subaerial geomorphic environments (lacustrine delta lobes, natural levees, backswamps) at the expense of lacustrine and fluvial environments. In the Terrebonne Marsh, Delta, and Area West, the opposite is occurring as the Teche and Lafourche delta lobes subside beneath the marsh and interdistributary bays. Consequently, older geomorphic features are being buried and become more inaccessible to cultural resource surveys. Investigations of the distribution of older cultural components (such as Archaic and Poverty Point cultures) will have to be conducted, for the most part, in the subsurface.

126. Using existing archeological site data, associations between archeological sites of specific cultural components and their geomorphic environment were examined (Table 4). Data in Table 4 indicate that older cultural components are not found (or identified) at the surface in the study areas. Only two Poverty Point sites were noted, and no archaic sites. The natural levees of the Teche distributary channels appear to have been preferred over the natual levees of the Lafourche distributaries, especially the Coles Creek cultural period. Unfortunately, 60 percent (123) of the site components (some sites had multiple components, hence 206 site components on 177 sites) was unknown.

127. Obviously, sites of older cultural components will be found (with younger components) on older geomorphic features. The probability of locating archaic (middle to late) sites is highest along the natural levee crests of the early Teche distributaries in the Area West, Delta, and western Terrebonne Marsh as well as on the salt domes. Sites older than Marksville (Tchefuncte, Poverty Point, and Archaic) should generally be absent on the Lafourche distributaries. Sites older than Coles Creek (Baytown, Troyville, Marksville, etc.) should be absent from all surfaces in the Atchafalaya Basin except the natural levees of larger distributaries.

Prediction of Site Destruction

128. In areas where lateral accretion or marine transgression has occurred, sites will be destroyed by erosional processes. Lateral accretion occurs primarily by channel meandering and the creation of point bars, as previously described. Channel meandering in the study areas appears to be rare due to the preponderance of fine-grained bank materials which are difficult to erode. Marine transgression is a more widespread phenomenon in the coastal plain as the delta lobes subside. Sites identified in bay shore environments are most likely the product of wave erosion and artifact reworking by transgression of the Gulf over the subsiding Teche delta lobe. Wave attack during storms in lacustrine environments (Atchafalaya Basin lakes and interdistributary bays in the Terrebonne Marsh) may also destroy lake shore sites.

Landscape/Landform Classification and Delineation

129. Geomorphic data presented on the geomorphic maps (Plates 1-55) provide a landscape/landform classification and delineation which is designed to provide a framework for the consideration of geomorphic factors during cultural resource surveys. Specific geomorphic features (landforms) are delineated and described which collectively comprise landscapes. The classification of geomorphic features is based on formative processes; therefore the geomorphic maps also indicate the presence or absence of geomorphic processes which profoundly influence site preservation or destruction.

Paleoenvironmental Data

130. Geomorphic features delineated on the maps and described in this report strongly influence the distribution of other (faunal, floral) types of natural environments in the region. The geomorphological chronology contained in this report may be combined with the geomorphic maps in the development of paleoenvironmental data necessary for the comprehensive analysis of cultural resources. Biostratigraphic data developed during this study indicate that a knowledge of geomorphic environments is fundamental to the conduct of paleofaunal and palynological investigations in support of archeological studies. Optimally, geomorphic data should be combined with subsequent paleoenvironmental analyses and archeological data in the reconstruction of the paleogeography of the region.

PART V: CONCLUSIONS

131. This report and the accompanying geomorphic maps (Plates 1-55) will be of greatest value to cultural resource investigations when the following conclusions are followed:

a. Geomorphic mapping in the Atchafalaya Basin delineated 11 geomorphic environments. These geomorphic environments comprise a landscape which is dominantly backswamp dissected by abandoned and active distributary channels.

b. The Atchafalaya Basin has experienced progressive basin-wide vertical sedimentation throughout the Holocene. The principal environments of deposition have been backswamp and shallow lacustrine, separated by lessor amounts of natural levee and channel deposition in localized distributary channels.

c. The vertical chronology of Holocene Atchafalaya Basin sediments, as established by radiometric dating, indicates that the upper 4.5 m (15 ft) of sediment is generally younger than 3,500 years old and the upper 9 m (30 ft) of sediment is less than 5,500 years old. Sediments of geomorphic features in the basin below 9 m (30 ft) and above a depth of 35 to 40 m (110 to 130 ft) generally date from the period 5,500 to 10,000 BP.

d. Prehistoric cultures appear to have focused on natural levees of distributaries and the shores of large lakes in the Atchafalaya Basin. These environments exist in the subsurface of the basin and may be buried by as much as 30 to 35 m (95 to 110 ft) of Holocene sediment.

e. Archeological sites which occur on subaerial natural levees of abandoned distributaries in the Atchafalaya Basin are probably no older than a maximum of 3,000 years and are usually younger than 1,500 years old.

f. Archeological sites associated with prehistoric lake shores in the Atchafalaya Basin are probably younger than 1,500 years old.

g. Historic activities of man have profoundly influenced the rates and processes of sedimentation in the Atchafalaya Basin, as evidenced by the historic filling of the Grand-Six Mile Lake system. Accelerated vertical accretion of sediment is presently burying archeological sites throughout the Atchafalaya Basin.

h. Geomorphic mapping in the Terrebonne Marsh, Delta, and Area West delineated 10 geomorphic environments. These geomorphic environments

comprise a landscape of fresh and brackish marshes and lakes separated by the abandoned distributaries.

i. At least three episodes of delta progradation have occurred in the Terrebonne Marsh, Delta, and Area West during the last 8,000 years. These deltaic complexes include the Maringouin (8,000 to 6,000 BP), Teche (5,800 to 3,500 BP), and the Lafourche (2,000 to 1,000 BP).

j. The surface of the Maringouin delta is buried beneath the Teche Delta in the study area at increasing depths from west (Area West) to east (eastern Terrebonne Marsh) as well as southward.

k. The Teche Mississippi Delta is presently exposed at the surface in the Area West and Delta and was buried by the Lafourche Mississippi Delta (with the exception of major natural levees along principal distributaries) in the Terrebonne Marsh. The elevation of the Top of the Teche Mississippi Delta varies from about 2 m (6 ft) above msl in the Area West to 15 m (50 ft) below msl in east Terrebonne Marsh. The elevation of the top of the Lafourche Mississippi Delta varies from about 2 m (6 ft) along Bayou Mauvais Bois to approximately 4.5 m (15 ft) on the eastern edge of Terrebonne Marsh.

l. Variations in the rates and loci of deposition, subsidence, and erosion in the Terrebonne Marsh have resulted in a subsurface stratigraphic sequence which is not correlative over long distances, and a substantial variability in time-depth relationships throughout the Terrebonne Marsh. Rates and loci of deposition, subsidence, and erosion have been more uniform in the Delta and Area West, producing similar time-depth relationships over wider areas.

m. Subsidence rates increase from west to east (Area West to Delta to Terrebonne Marsh) due to the increasing depth to stable Pleistocene sediments and the decreasing age (and consolidation) of Holocene sediments.

n. Present geomorphic surfaces in the Area West and Delta were formed in the early to middle stage of the Teche Mississippi Delta, 5,800 to 4,000 years ago, with the exception of the salt domes (Pleistocene).

o. Present geomorphic surfaces in the Terrebonne Marsh include natural levees of Teche distributaries (formed 4,000 to 3,500 years BP), Lafourche distributary natural levees (formed 2,000 to 1,000 years BP), and marshes formed in the last 1,000 years.

p. Buried archeological sites most likely occur beneath marsh and swamp deposits adjacent to remnant (presently subaerial) natural levees of abandoned Teche and Lafourche distributaries in the Terrebonne Marsh, Delta, and Area West.

q. Buried archeological sites most likely occur on the flanks of the abandoned beach ridge mapped in the Terrebonne Marsh.

r. The decrease in the occurrence of archeological sites in the Delta and Area West over the Terrebonne Marsh is most likely a product of the decreased number of distributary channels in the Area West and Delta as well as variability in resource availability and exploration strategies of different prehistoric cultures.

132. Future geomorphological, paleoenvironmental, and archeological studies in the Atchafalaya Basin, Terrebonne Marsh, Delta, and Area West will undoubtably expand upon the conclusions of this study, and promise to provide substantial contributions to the history of the evolution of prehistoric nan in southern Louisiana.

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Table I

Biostratigraphic Formainiferal Assemblages

A. AGGLUTINATED FORAMINIFERAL ASSEMBLAGE

Ammoastuta inepta (Cushman and McCulloch)
Ammobaculites sp.
Ammotium salsum (Cushman and Bronnimann)
Arenoparrella mexicana (Kornfeld)
Haplophragmoides manilaensis (Andersen)
Haplophragmoides wilberti (Andersen)
Miliammina fusca (H. B. Brady)
Tiphotrocha comprimata (Cushman and Bronnimann)
Trochammina inflata (Montagu)
Trochammina macrescens (Brady)
Trochamminita irregularis (Cushman and Bronnimann)
Trochamminita salsa (Cushman and Bronnimann)

B. CALCAREOUS FORAMINIFERAL ASSEMBLAGE

Ammonia beccarii (Linne)
Ammotium salsum (Cushman and Bronnimann)
Elphidium clavatum (Cushman)
Elphidium galvestonense (Kornfeld)
Elphidium gunteri (Cole)
Elphidium kugleri (Cushman and Bronnimann)
Haynesina germanica (Ehrenberg)

Table 2

Approximate Vertical Chronology For Atchafalaya Basin Deposits

Elevation in Feet Below MSL	Elevation in Metres Below MSL	Approximate Time Range Before Present	Major Mississippi River Courses-Deltas
0-15	0- 9.5	Present to 3500	Modern, LaFourche, and Teche
15-30	4.5- 9.1	3500 to 5500	Teche
30-75	9.1-22.9	5500 to 8500	Maringouin
75-130	22.9-39.6	8500 to 10000	Pre-Maringouin, Early Holocene
130-270	39.6-82.3	10000 to 35000	Pleistocene Miss. River

Table 3
Archeological Site - Geomorphic Environment Associations

Geomorphic Environment	Atchafalaya Basin	Terrebonne Marsh	Delta	Area West	Combined Study Areas
*NL, Basin Distributary	22	--	--	--	--
NL, Teche Distributary	--	29	3	11	43
NL, LaFourche Distributary	--	28	--	--	28
NL, Teche Course	19	12	--	1	32
NL, Lac. Delta Channel	3	--	--	--	3
Basin Lake Shore	16	--	--	--	16
Lacustrine Delta	1	--	--	--	1
Backswamp	4	--	--		4
Beach Ridge	--	5	--	--	5
Bay Shore	--	3	--	3	6
Tidal Channel	--	--	2	1	3
Fresh Marsh	--	1	4	--	5
Brackish Marsh	--	1	--	--	1
Inland Swamp	--	--	--	1	1
Salt Dome	--	--	--	7	7
Total	65	79	9	24	177

* NL = natural levee

Table 4

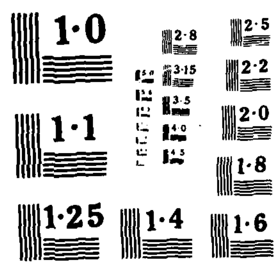
Archeological site Cultural Component - Geomorphic Environment Associations

Geomorphic Environment	Plaquemine-Mississippian	Coles Creek	Baytown Troyville, Marksville	Tchefuncte	Poverty Point	Unknown	Total
NL, Basin Dist.	6	4	0	1	2	15	28
NL, Teche Dist.	5	16	3	1	0	29	54
NL, LaFourche Dist.	2	2	0	0	0	24	28
NL, Teche Course	4	10	1	0	0	21	36
NL, Lac. Delta Channel	0	0	0	0	0	3	3
Basin Lake Shore	7	1	0	0	0	10	18
Lacustrine Delta	0	0	0	0	0	1	1
Backswamp	1	0	0	0	0	3	4
Beach Ridge	1	0	0	0	0	4	5
Bay Shore	0	1	5	2	0	1	9
Tidal Channel	0	0	0	0	0	3	3
Fresh Marsh	0	0	0	0	0	5	5
Brackish Marsh	0	1	0	0	0	0	1
Inland Swamp	0	0	0	0	0	1	1
Salt Dome	2	1	3	1	0	3	10
Total	28	36	12	5	2	123	206

APPENDIX A
WES BORING LOGS

AD-A168 865 GEOMORPHOLOGICAL INVESTIGATION OF THE ATCHAFALAYA BASIN 2/9
AREA WEST ATCHAFA..(U) ARMY ENGINEER WATERWAYS
EXPERIMENT STATION VICKSBURG MS GEOTE..

UNCLASSIFIED L M SMITH ET AL. APR 86 F/G 8/6 NL


1·0
2·8
2·5
3·15
2·2
3·5
2·0
4·0
1·1
4·5
1·8
1·25
1·4
1·6

INDEX TO BORING DATA

BORING NO.	GEOMORPHIC MAP AND PLATE NO.	BORING LOG PLATE NO.
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L-1	JACKASS (PLATE 19)	A11
N-1	NAPOLEONVILLE SW (PLATE 30)	A18
N-2	NAPOLEONVILLE SW (PLATE 30)	A25
C-7	CENTERVILLE (PLATE 28)	A26
C-11	TIGER IS. (PLATE 29)	A27
C-12	TIGER IS. (PLATE 29)	A28
C-100	CENTERVILLE (PLATE 28)	A29
C-101	CENTERVILLE (PLATE 28)	A31
MC-2	MORGAN CITY SE (PLATE 42)	A32
MC-3	MORGAN CITY SE (PLATE 42)	A33
MC-4	MORGAN CITY SE (PLATE 42)	A35
MC-5	MORGAN CITY SW (PLATE 41)	A37
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MC-7	MORGAN CITY SE (PLATE 42)	A39
G-3	HOUMA (PLATE 45)	A41
G-4	HOUMA (PLATE 45)	A47
G-5	BAYOU COCODRIE (PLATE 43)	A54
G-6	BAYOU COCODRIE (PLATE 43)	A56
G-64	BAYOU COCODRIE (PLATE 43)	A58
G-7	HUMPHREYS (PLATE 44)	A60
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LD-2	LOST LAKE (PLATE 53)	A68
LD-3	CARENCRO BAYOU (PLATE 48)	A70
LD-4	CARENCRO BAYOU (PLATE 48)	A72
LD-6	PLUMB BAYOU (PLATE 47)	A74
LD-7	PLUMB BAYOU (PLATE 47)	A76
LD-11	LOST LAKE (PLATE 53)	A78

BORING NO.	GEOMORPHIC MAP AND PLATE NO.	BORING LOG PLATE NO.
BDL-2	LAKE THERIOT (PLATE 50)	A80
BDL-3	LAKE THERIOT (PLATE 50)	A87
BDL-4	LAKE PENCHANT (PLATE 49)	A89
BDL-8	LAKE PENCHANT (PLATE 49)	A90
BDL-84	LAKE PENCHANT (PLATE 49)	A92
BDL-10	LAKE PENCHANT (PLATE 49)	A94
BDL-11	BAYOU COCODRIE (PLATE 43)	A96
BDL-12	LAKE PENCHANT (PLATE 49)	A98
BDL-20	LAKE PENCHANT (PLATE 49)	A99
SI-1	LAKE PENCHANT (PLATE 49)	A100

BORING LITHOLOGY

Organics

Peat

Shell

Clay

Silt

Sand

Silt and Clay Laminations

Sand and Silt - Clay Laminations

MUNSELL SOIL COLOR

2.5Y2/0	Black
2.5Y3/2	Very Dark Grayish Brown
2.5Y4/2	Dark Grayish Brown
2.5Y4/4	Olive Brown
2.5Y5/2	Grayish Brown
2.5Y5/4	Light Olive Brown
2/5Y6/2	Light Brownish Gray
2.5YR	Black
2.5YR2.5/0	Black
2.5YR3/1	Very Dark Gray
2.5YR4/0	Dark Gray
2.5YR4/4	Reddish Brown
2.5YR4/6	Red
5Y2.5/1	Black
5Y2.5/2	Black
5Y3/1	Very Dark Gray
5Y3/2	Dark Olive Gray
5Y3/3	Dark Olive
5Y4/1	Dark Gray
5Y4/2	Olive Gray
5Y4/3	Olive
5Y5/1	Gray
5Y5/2	Olive Gray
5Y5/3	Olive

5YR2.5/0	Black
5YR2.5/1	Black
5YR4/3	Reddish Brown
7.5YR2/0	Black
7.5YR4/0	Very Dark Brown
10YR2/1	Black
10YR2/2	Very Dark Brown
10YR2/4	Dark Yellowish Brown
10YR3/1	Very Dark Gray
10YR3/2	Very Dark Grayish Brown
10YR3/3	Dark Brown
10YR4/1	Dark Gray
10YR4/2	Dark Grayish Brown
10YR4/3	Dark Brown
10YR5/1	Gray
10YR5/3	Brown
10YR5/4	Yellowish Brown
10YR5/6	Yellowish Brown
10YR6/1	Gray
10YR6/3	Pale Brown

BORING NUMBER: M-1
QUADRANGLE: MARINGOUIN
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SF	ORGANICS B	D	FD	W	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1		CLAY	5Y4/1		V. FIRM	MOIST	•																•			BS	
20		•	•	2.5YR5/6	•	•	•																•			BS	NODULES
30		•	•	•	•	•	•																•			BS	•
40		•	•	•	•	•	•																•			BS	•
50		•	•	•	•	•	•																•			BS	•
60		•	•	•	•	•	•																•			BS	•
70		•	•	•	•	•	•																•			BS	•
80		•	•	•	•	•	•																•			BS	•
90		•	•	•	•	•	•																•			BS	•
100		•	•	•	•	•	•																•			BS	•
110		•	•	•	•	•	•																•			BS	•
120		•	•	•	•	•	•																•			BS	•
130		•	•	•	•	•	•																•			BS	•
140		•	•	•	•	•	•																•			BS	•
150		•	•	•	•	•	•																•			BS	•
160		•	•	•	•	•	•																•			BS	•
170		•	•	•	•	•	•																•			BS	•
180		•	5Y4/1	•	•	•	•																•			BS	•
190		•	•	•	•	•	•																•			BS	•
200		•	•	•	•	•	•																•			BS	•
210		•	•	•	•	•	•																•			BS	•
220		•	•	•	•	•	•																•			BS	•
230		•	•	•	•	•	•																•			BS	•
240		•	•		•	•	•																•			BS	•
250		•	•		•	•	•																•			BS	•
260		•	•		•	•	•																•			BS	•
270		•	•		•	•	•																•			BS	•
280		•	•		•	•	•																•			BS	•
290		•	5Y4/1	2.5YR5/6	•	•	•																•			BS	
300		•	•	•	•	•	•																•			BS	NODULES
310		•	•	•	•	•	•																•			BS	•
320		•	•	•	•	•	•																•			BS	•
330		•	•	•	•	•	•																•			BS	•
340		•	•	•	•	•	•																•			BS	•
350		•	•	•	•	•	•																•			BS	•
360		•	•	•	•	•	•																•			BS	•
370		•	•	•	•	•	•																•			BS	•
380		•	•		•	•	•																•			BS	•
390		•	•		•	•	•																•			BS	•
400		•	•		•	•	•																•			BS	•
410		•	•		•	•	•																•			BS	•
420		•	•		•	•	•																•			BS	•
430		•	•		•	•	•																•			BS	•
440		•	•		•	•	•																•			BS	•
450		•	•		•	•	•																•			BS	•
460		•	•		•	•	•																•			BS	•
470		•	•		•	•	•																•			BS	•
480		•	•		•	•	•																•			BS	•
490		•	•		•	•	•																•			BS	•
500		•	•		FIRM	•	•																•			BS	•
510		•	•		•	•	•																•			BS	•

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Sub-stratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: P-1
QUADRANGLE: MARINGOUIN
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520		CLAY	5Y5/1	10YR5/6	FIRM	MOIST			BS	NODULES
530		•	•	•	•	•			BS	•
540		•	•	•	•	•			BS	•
550		•	•	•	•	•			BS	•
560		•	•		•	•			BS	•
570		•	•		•	WET			BS	•
580		•	•	10YR5/6	•	•			BS	•
590		•	•	•	•	•			BS	•
600		•	•	•	•	•			BS	•
610		•	•	•	•	•			BS	•
620		•	•	•	•	•			BS	•
630		•	•	•	•	•			BS	•
640		•	•	•	•	•			BS	•
650		•	•	•	•	•			BS	•
660		•	•	•	•	•			BS	•
670		•	•	•	•	•			BS	•
680		•	•	•	•	•			BS	•
690		•	•	•	•	•			BS	•
700		•	•		•	•			BS	•
710		•	•		•	•			BS	•
720		•	•		•	•			BS	•
730		•	•		•	•			BS	•
740		•	10YR4/1		V. FIRM	MOIST			BS	PYRITIZED
750		•	•		•	•			BS	ROOTS
760		•	•		•	•			BS	•
770		•	•		•	•			BS	•
780		•	•		•	•			BS	•
790		•	•		•	•			BS	NODULES
800		•	•		•	•			BS	•
810		•	•		•	•			BS	•
820		•	•		•	•			BS	•
830		•	•		•	•			BS	•
840		•	•		•	•			BS	•
850		•	•		•	•			BS	•
860		•	•		•	•			BS	•
870		•	•		•	•			BS	•
880		•	•		•	•			BS	•
890		•	5Y5/1		•	•			BS	•
900		•	•		•	•			BS	•
910		•	•		•	•			BS	•
920		•	•		•	•			BS	•
930		•	•		•	•			BS	•
940		•	•		•	•			BS	•
950		•	•		•	•			BS	•
960		•	•		•	•			BS	•
970		•	•		•	•			BS	•
980		•	•		•	•			BS	•
990		•	•		•	•			BS	•
1000		•	•		•	•			BS	•
1010		•	•		•	•			BS	•
1020		•	•		•				BS	•

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MD = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=Massive P=Parallel L=Lenticular W=Wavy C=Cross R=Ripple SC=Scour & Fill BE=Bedded D=Distinct FD=Finely divided S=Shells BR=Burrows LC=Load casts DT=Distorted F=Fractures IN=Inclusions

PLATE A6

BORING NUMBER: R-1
QUADRANGLE: MARINGOUIN
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

[LAMINATIONS] [ORGANICS] [SECONDARY STRUCTURE]

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SC	B	D	FD	M	S	BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1030		CLAY	5Y5/1		V. FIRM	MOIST	•																•			BS	NODULES
1040		•	•		•	•	•																•			BS	•
1050		•	•		•	•	•																•			BS	•
1060		•	•		•	•	•																•			BS	•
1070		•	•		•	•	•																•			BS	•
1080		•	•		•	•	•																•			BS	•
1090		•	•		•	•	•																•			BS	•
1100		•	•		•	•	•																•			BS	•
1110		•	•		•	•	•																•			BS	•
1120		•	•		•	•	•																•			BS	•
1130		•	•		•	•		•									•									BS	
1140		•	•		•	•		•									•									BS	
1150		•	•		•	•		•									•									BS	
1160		•	•		•	•		•									•						•			BS	NODULES
1170		•	•		•	•		•									•						•			BS	•
1180		•	•		•	•		•									•						•			BS	•
1185		•	•		•	•		•									•						•			BS	•
1190		PEAT			•	•		•									•						•			BS	•
1200		•			•	•		•									•						•			BS	•
1210		•			•	•		•									•						•			BS	•
1220		•			•	•		•									•						•			BS	•
1230		•			•	•		•									•						•			BS	•
1240		CLAY	5Y4/1		V. FIRM	MOIST		•									•						•			BS	•
1250		•	•		•	•		•																		BS	
1260		•	•		•	•		•																		BS	
1270		•	•		•	•		•																		BS	
1280		•	•		•	•		•																		BS	
1290		•	•		•	•		•																		BS	
1300		•	•		•	•		•																		BS	
1310		•	•		•	•		•																		BS	
1320		•	•		•	•		•																		BS	
1330		•	•		•	•		•																		BS	
1340		•	•		•	•		•																		BS	
1350		•	•		•	•		•																		BS	
1360		•	•		•	•		•																		BS	
1370		•	•		•	•		•																		BS	
1380		•	•		•	•		•																		BS	
1390		•	•		•	•		•																		BS	
1400		•	•		•	•		•																		BS	
1410		NO SAMPLE																									
1420		NO SAMPLE																									
1430		NO SAMPLE																									
1440		NO SAMPLE																									
1450		NO SAMPLE																									
1460		NO SAMPLE																									
1470		CLAY	5Y4/1		V. FIRM	MOIST	•																			BS	
1480		•	•		•	•	•																•			BS	
1490		•	•		•	•	•																•			BS	
1500		•	•		•	•	•																•			BS	
1510		•	•		•	•	•																•			BS	
1520		•	•		•	•	•																•			BS	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A7

BORING NUMBER M-1
QUADRANGLE: MARINGOUIN
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(LAMINATIONS) M P L W C R	SF	(ORGANICS) B D FD M	S	(SECONDARY STRUCTURE) BR LC BI F IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1530		CLAY	[illegible]		[illegible] FIRM	[illegible]								[illegible]	
1540															
1550															
1560															
1570															
1580															
1590															
1600															
1610															
1620															
1630															
1640															
1650															
1660															
1670															
1680															
1690															
1700															
1710															
1720															
1730															
1740															
1750															
1760															
1770															
1780															
1790															
1800															
1810															
1820															
1830															
1840															
1850															
1860															
1870															
1880															
1890															
1900															
1910															
1920															
1930															
1940															
1950															
1960															
1970															
1980															
1990															
2000															
2010		SILT	5Y4/[illegible]		V. FIRM	MOIST								[illegible]	
2020															
2030															

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee [illegible] CF = Channel Fill [illegible]

STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy [illegible]

PLATE A8

BORING NUMBER. M-1
QUADRANGLE: MARINGOUIN
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

							[		LAMINATIONS				]	[		ORGANICS		]	[SECONDARY STRUCTURE]							DEPOSIT	
DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SF	B	D	FD	M	S	BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	ENVIRON	REMARKS
2040		SILT	5Y4/2		V. FIRM	MOIST	•																•			BS	
2050		•	•		•	•	•																•			BS	
2060		•	•		•	•	•																•			BS	
2070		•	•		•	•	•																•			BS	
2080		•	•		•	•	•																•			BS	
2090		•	•		•	•	•																•			BS	
2100		•	•		•	•	•																•			BS	
2110		CLAY	5Y4/2		V. FIRM	MOIST	•																•			BS	
2120		•	•		•	•	•																•			BS	
2130		SILT	5Y4/2		V. FIRM	MOIST	•																•			BS	
2140		•	•		•	•	•																•			BS	
2150		•	•		•	•	•																•			BS	
2160		•	•		•	•	•																•			BS	
2170		•	•		•	•	•																•			BS	
2180		CLAY	5Y4/1		V. FIRM	MOIST	•																•			BS	
2190		•	•		•	•	•																•			BS	
2200		•	•		•	•	•																•			BS	
2210		CLAYEY	5Y4/2		FIRM	MOIST	•																•			BS	
2220		CLAY	5Y4/1		V. FIRM	MOIST	•																•			BS	
2230		•	•		•	•	•																•			BS	
2240		•	•		•	•	•																•			BS	
2250		CLAY	5Y4/1		V. FIRM	MOIST	•																•			BS	
2260		•	•		•	•	•																•			BS	
2270		•	•		•	•	•																•			BS	
2280		•	•		•	•	•																•			BS	
2290		FINE SAND	5Y4/2		FIRM	MOIST					•															L	
2300		•	•		•	•					•															L	
2310		•	•		•	•					•												•			L	
2320		•	•		•	•					•												•			L	
2330		•	•		•	•					•												•			L	
2340		•	•		•	•					•												•			L	
2350		•	•		•	•					•												•			L	
2360		CLAY	5Y4/1		V. FIRM	MOIST	•																•			L	
2370		•	•		•	•	•																•			L	
2380		•	•		•	•		•															•			L	
2390		•	•		•	•		•															•			L	
2400		•	•		•	•		•															•			L	
2410		•	•		•	•		•															•			L	
2420		•	•		•	•		•															•			L	
2430		•	•		•	•	•																•			L	
2440		•	•		•	•	•																•			L	
2450		•	•		•	•	•																•			L	
2460		•	•		•	•	•																•			L	
2470		•	•		•	•	•																•			L	
2480		•	•		•	•	•																•			L	
2490		•	•		•	•	•																•			L	
2500		•	•		•	•	•																•			L	
2510		•	•		•	•	•																•			L	
2520		•	•		•	•	•																•			L	
2530		•	•		•	•	•																•			L	
2540		•	•		•	•	•																			L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LC = Lacustrine Delta MI = Midden S = Spoil IN,BS = In[illegible] or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load cast DT=distorted F=fractures IN=inclusions

BORING NUMBER: M-1
QUADRANGLE: MARINGOUIN
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

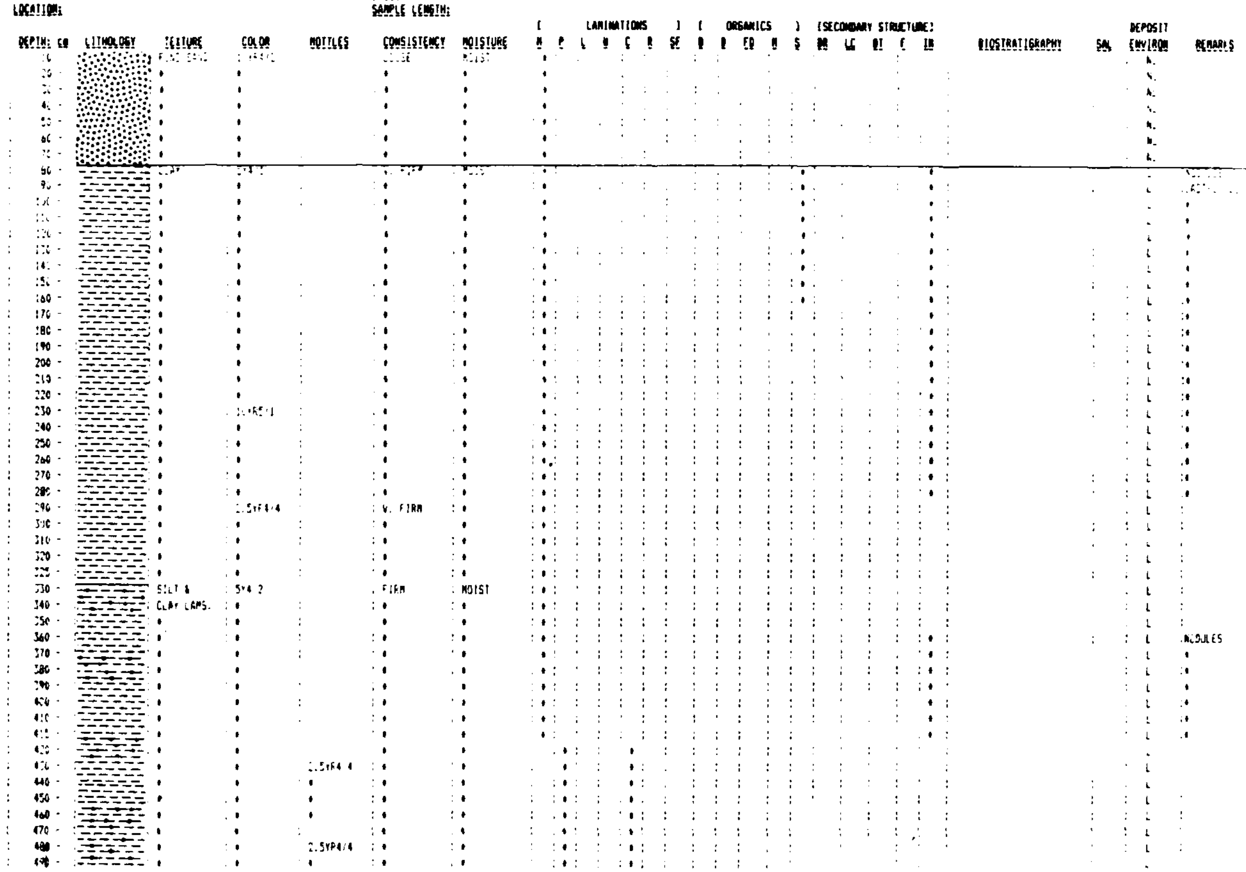
DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS (M P L W C R)	SE	ORGANICS (D FD M S)	SECONDARY STRUCTURE (BR LC BT F IN)	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
2550		CLAY	[illegible]		V. FIRM	MOIST								
2560														
2570														
2580														
2590														
2600														
2610													L	
2620													L	
2630														
2640														
2650														
2660														
2670														
2680														
2690														
2700													L	
2710													L	
2720													L	
2730													L	
2740		SAND MED	[illegible]		LOOSE	MOIST							ST	
2750													ST	
2760													ST	
2770													ST	
2780													ST	
2790													ST	
2800													ST	
2810													ST	
2820														
2830														
2840														

DEPOSITIONAL ENVIRONMENT: M = Mar... NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MO = Midden S = Spoil IS,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=para... L=lenticular W=wavy C=cross R=ripple SC=scour & fill E=bedded D=distinct F=finely divided S=shells B=burrows LC=load casts D=distorted F=fractures IN=inclusions

PLATE A10

BORING NUMBER: L-1
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:



DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LC = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells B=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A11

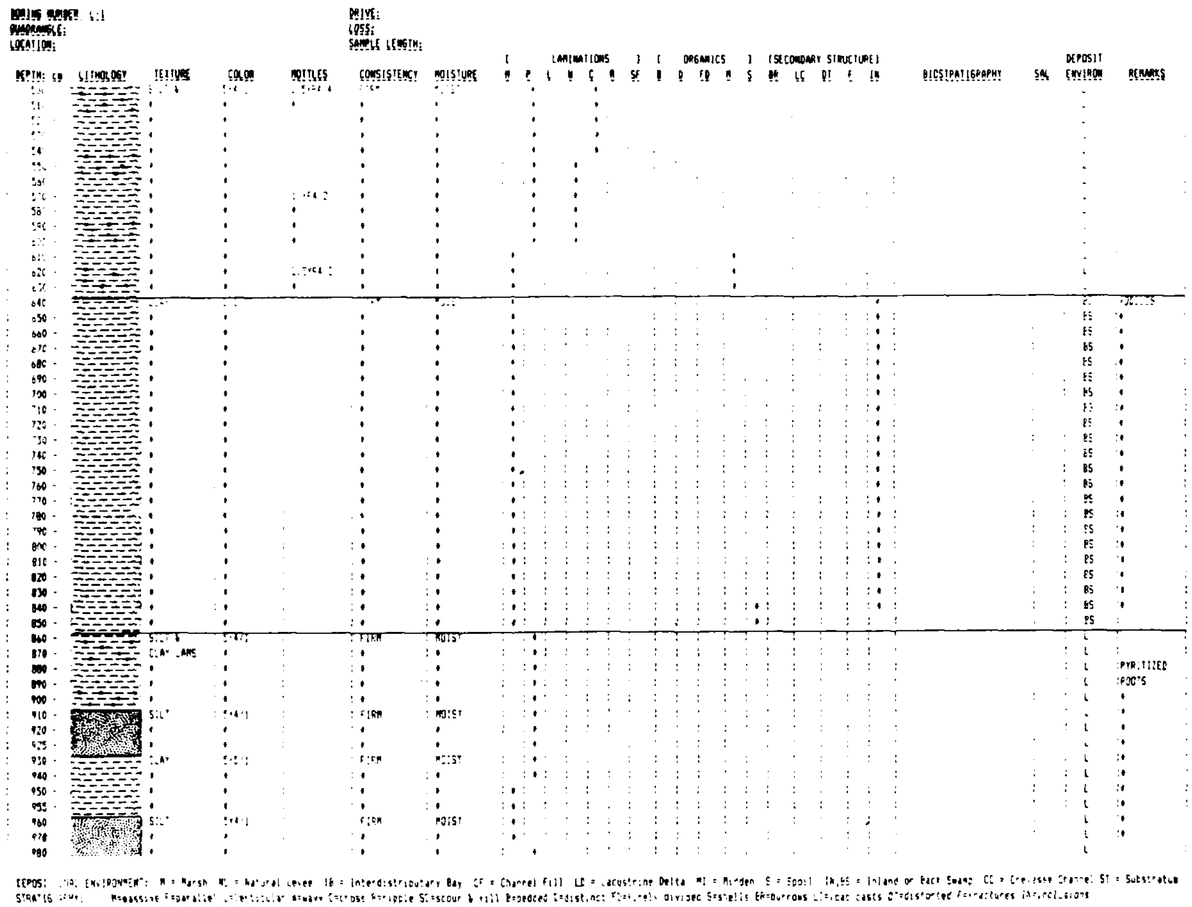

BORING NUMBER
QUADRANGLE:
LOCATION:
DRIVE:
LOSS:
SAMPLE LENGTH:
DEPTH: cm
LITHOLOGY
TEXTURE
COLOR
MOTTLES
CONSISTENCY
MOISTURE
LAMINATIONS
ORGANICS
SECONDARY STRUCTURE
BIOSTRATIGRAPHY
SAL
DEPOSIT ENVIRON
REMARKS
SILT &
CLAY LAMS
FIRM
MOIST
PYRITIZED
ROOTS
SILT
CLAY
DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum

PLATE A12

BORING NUMBER: L-1
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	[LAMINATIONS M	P	L	W	C	R	SF]	[ORGANICS B	R	FD	N	S]	(SECONDARY STRUCTURE) BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
990 -		SILT	5Y4/1		FIRM	MOIST		•																		L	
1000 -		•	•		•	•		•																		L	
1010 -		•	•		•	•		•																		L	
1015 -		•	•		•	•		•																		L	
1020 -		CLAY	5Y5/1		FIRM	MOIST		•																		L	
1030 -		•	•		•	•		•																		L	
1040 -		•	•		•	•		•				•														L	
1050 -		•	•		•	•		•				•														L	
1060 -		•	•		•	•		•				•														L	
1070 -		•	•		•	•		•				•														L	
1080 -		•	•		•	•		•				•														L	
1090 -		•	•		•	•		•																		L	
1100 -		•	•		•	•		•																		L	
1110 -		•	•		•	•		•											•		•					L	
1120 -		•	•		•	•		•											•		•					L	
1130 -		•	•		•	•		•													•					L	ROOTLETS
1140 -		•	•		•	•		•													•					L	•
1145 -		•	•		•	•		•													•					L	•
1150 -		•	•		•	•	•																			L	•
1160 -		•	•		•	•	•									•										L	
1170 -		•	•		•	•	•									•										L	
1180 -		•	•		•	•	•									•										L	
1190 -		•	•		•	•	•									•										L	
1200 -		•	•		•	•	•									•										L	
1210 -		•	•		•	•	•									•										L	
1220 -		•	•		•	•	•									•										L	
1230 -		•	•		•	•	•									•										L	
1240 -		•	•		•	•	•									•										L	
1250 -		•	•		•	•	•									•										L	
1260 -		•	•		•	•	•									•										L	
1270 -		•	•		•	•	•									•										L	
1280 -		•	•		•	•	•									•										L	
1290 -		•	•		•	•	•									•										L	
1300 -		•	•		•	•	•									•										L	
1310 -		•	•		•	•	•																			L	
1320 -		•	•		•	•	•														•					L	
1330 -		•	•		•	•	•														•					L	
1340 -		•	•		•	•	•											•								L	
1350 -		•	•		•	•	•											•								L	
1360 -		•	•		•	•	•											•								L	GASTROPOD
1370 -		•	•		•	•	•											•								L	
1380 -		•	•		•	•	•											•								L	
1390 -		•	•		•	•	•											•								L	
1400 -		•	•		•	•	•											•								L	
1410 -		•	•		•	•	•																			L	
1420 -		•	•		•	•	•																			L	
1430 -		•	•		•	•	•																			L	
1440 -		•	•		•	•	•																			L	
1450 -		ORG CLAY	2.5YR3/1		FIRM	MOIST	•										•	•				•				L	SHELL ZONE
1460 -		•	•		•	•	•										•									L	
1470 -		•	•		V. FIRM	•	•										•									L	SHELL ZONE

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LB = Lacustrine ... MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=intrusions

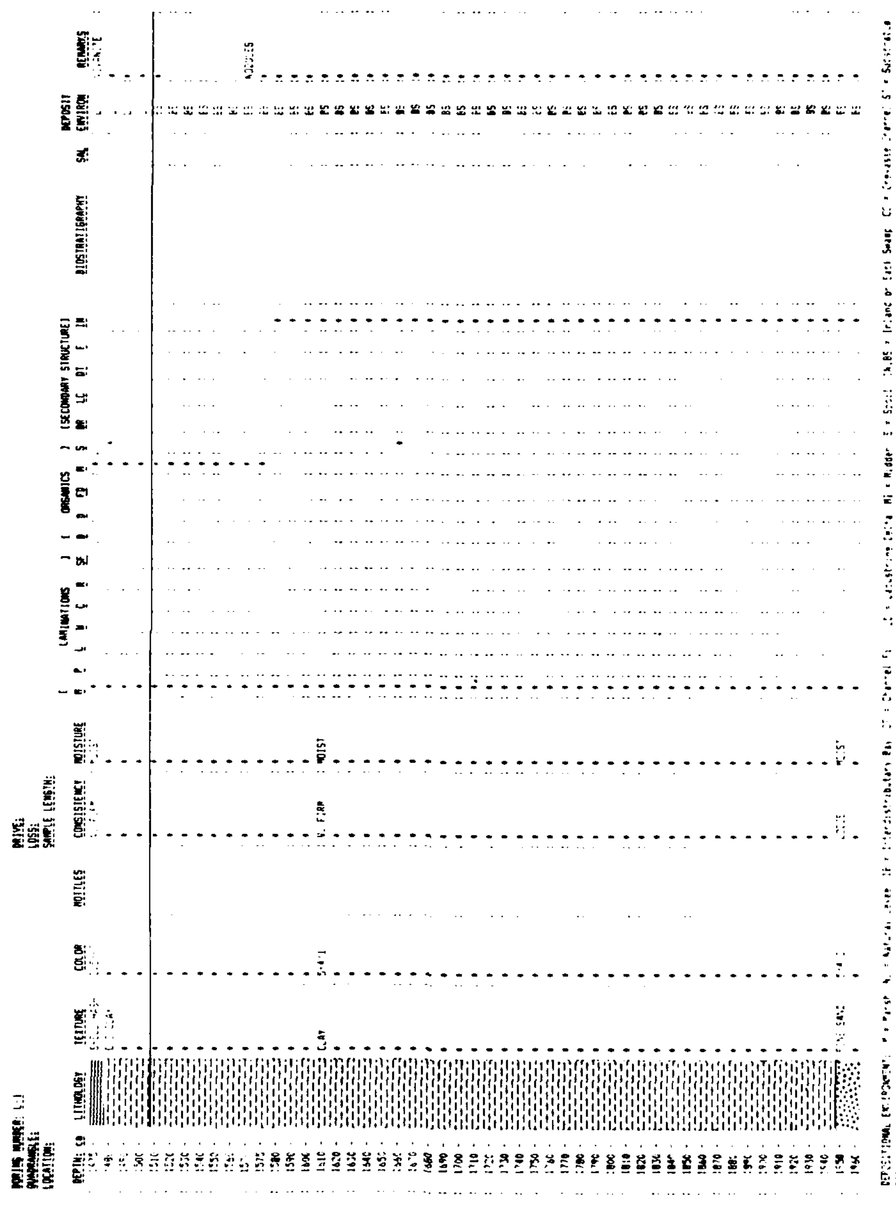

BORING NUMBER:
QUADRANGLE:
LOCATION:
DRIVE:
LOSS:
SAMPLE LENGTH:
DEPTH: cm
LITHOLOGY
TEXTURE
COLOR
MOTTLES
CONSISTENCY
MOISTURE
LAMINATIONS
ORGANICS
(SECONDARY STRUCTURE)
BIOSTRATIGRAPHY
SAL
DEPOSIT ENVIRON
REMARKS
CLAY
V. FIRM
MOIST
FINE SAND
NODULES
DEPOSITIONAL ENVIRONMENT:
STRATIGRAPHY:

PLATE A14

BORING NUMBER L-1
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: CM	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	DEPOSIT ENVIRON	REMARKS
[illegible]	FINE SAND	[illegible]		LOOSE	MOIST	[illegible]	
[illegible]	CLAY	[illegible]		V. FIRM	MOIST	PS	
2250				FIRM		PS	
2300	FINE SAND & CLAY LAMS.	5Y4/1		FIRM	MOIST	BS	
2440						L	
2450						L	
2450						L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = [illegible]
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A15

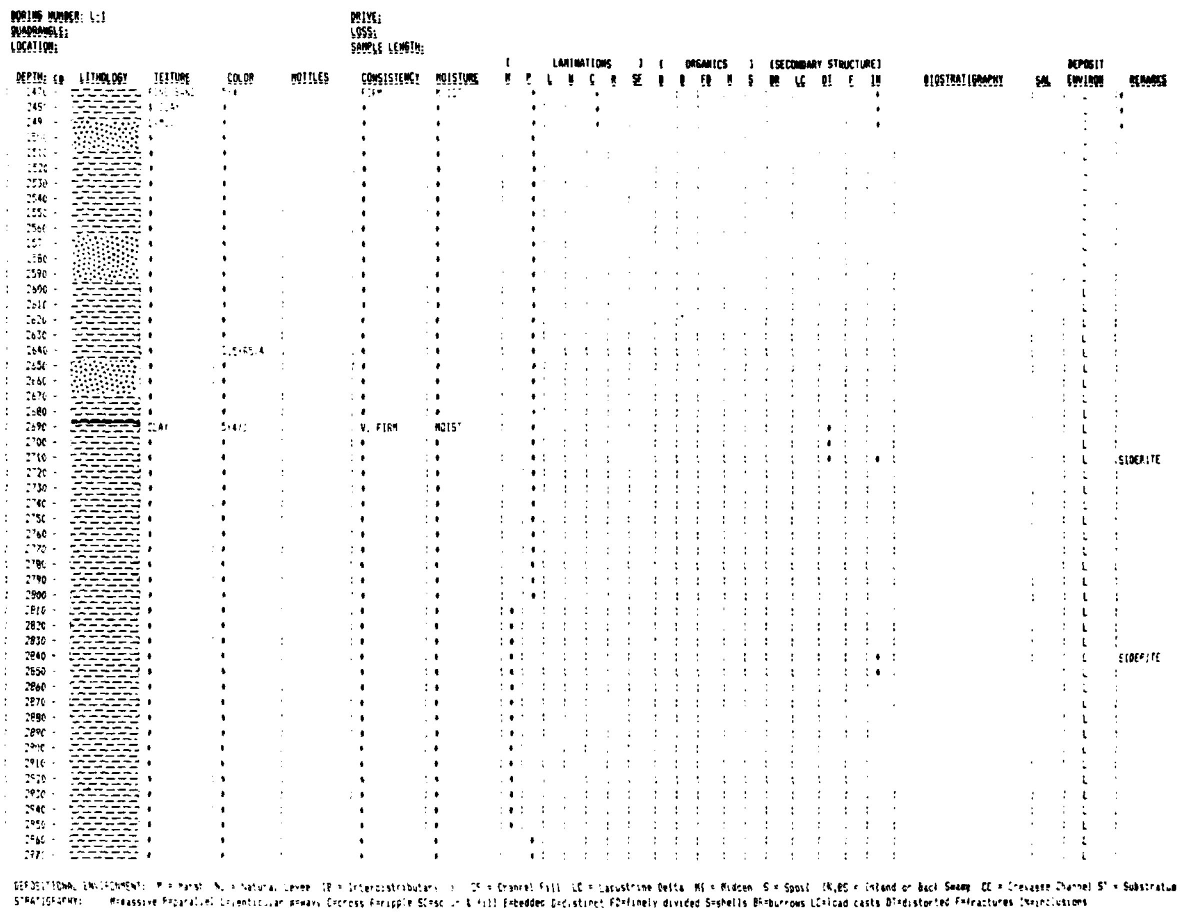

BORING NUMBER:
QUADRANGLE:
LOCATION:
DRIVE:
LOSS:
SAMPLE LENGTH:
DEPTH
LITHOLOGY
TEXTURE
COLOR
MOTTLES
CONSISTENCY
MOISTURE
LAMINATIONS
ORGANICS
SECONDARY STRUCTURE
BIOSTRATIGRAPHY
SAL
DEPOSIT ENVIRON
REMARKS
CLAY
V. FIRM
MOIST
SIDERITE
SIDERITE

PLATE A16

BORING NUMBER: L-1
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(M	P	LAMINATIONS L	W	C	R	) SF	(B	ORGANICS D	FD	W	) S	(SECONDARY STRUCTURE) BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]						[illegible]								[illegible]					[illegible]	

DEPOSITIONAL ENVIRONMENTS: M = Marsh, NL = Natural Levee, IB = Interdistributary Bay, CF = Channel Fill, LD = Lacustrine Delta, MD = Midden, S = Spoil, IN,BS = Inland or Back Swamp, CC = Crevasse ... SF = Substratum
STRATIGRAPHY: ... Massive P=parallel L=lenticular W=wavy ... [illegible]

PLATE A17

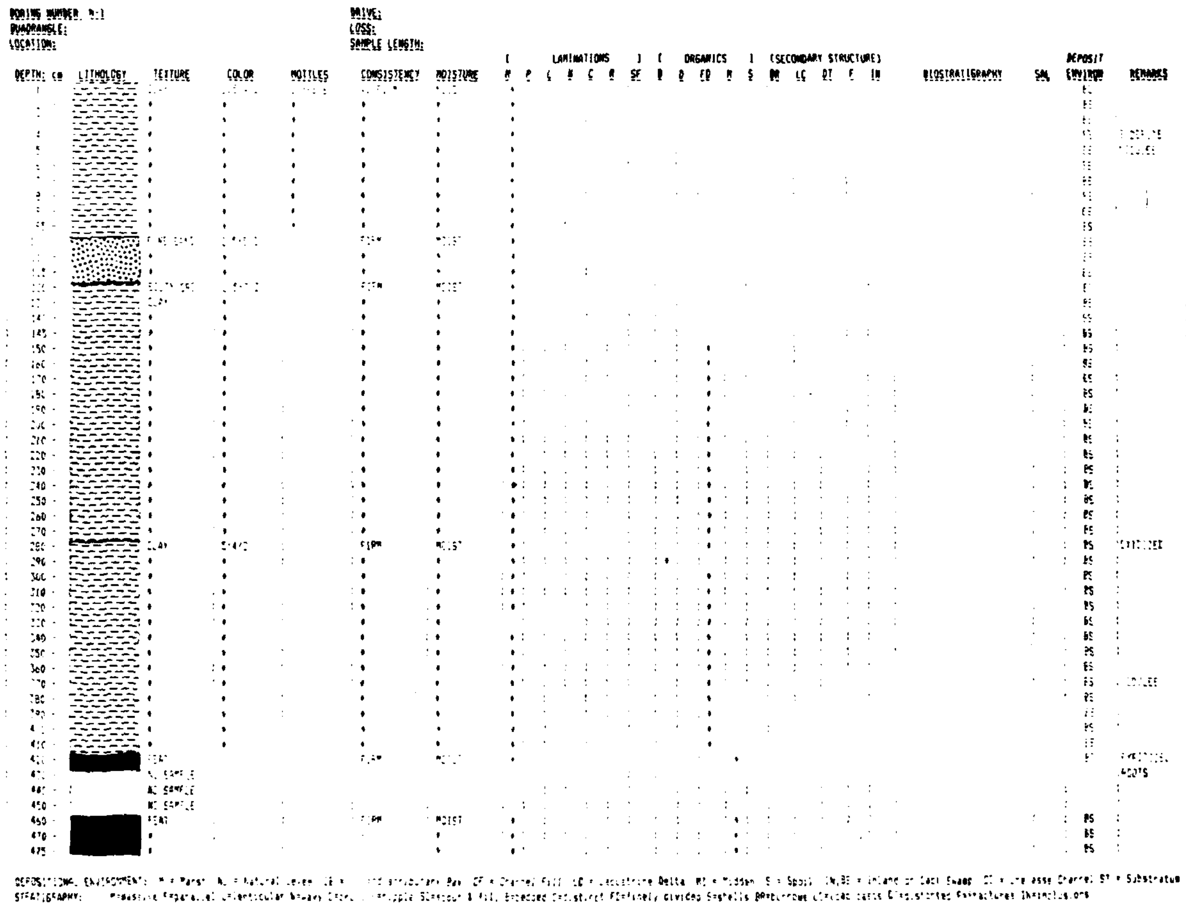

BORING NUMBER N:1
QUADRANGLE:
LOCATION:
DRIVE:
LOSS:
SAMPLE LENGTH:
DEPTH: cm
LITHOLOGY
TEXTURE
COLOR
MOTTLES
CONSISTENCY
MOISTURE
LAMINATIONS
ORGANICS
(SECONDARY STRUCTURE)
BIOSTRATIGRAPHY
SAL
DEPOSIT ENVIRON
REMARKS
FIRM
MOIST
CLAY
NO SAMPLE
NO SAMPLE
NO SAMPLE
PEAT
ROOTS
DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee ... = Substratum
STRATIGRAPHY:

PLATE A18

BORING NUMBER: N-1
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	DEPOSIT ENVIRON	REMARKS
[illegible]	[illegible] CLAY	[illegible]		[illegible]	WET	[illegible]	
[illegible]	•	•		•	•	[illegible]	
[illegible]	•	•		•	•	[illegible]	
[illegible]	•	•		•	•	[illegible]	
[illegible]	•	•		•	•	[illegible]	[illegible]
[illegible]	•	•		•	•	[illegible]	
[illegible]	NO SAMPLE						
550	NO SAMPLE						
[illegible]	NO SAMPLE						
[illegible]	NO SAMPLE						
[illegible]	NO SAMPLE						
[illegible]	NO SAMPLE						
[illegible]	NO SAMPLE						
[illegible]	NO SAMPLE						[illegible]
[illegible]	[illegible] CLAY	[illegible]		SOFT	WET	BS	
630	•	•		•	•	BS	
635	•	•		•	•	BS	
640	CLAY	[illegible]		V. FIRM	MOIST	BS	
650	•	•		•	•	BS	
660	•	•		•	•	BS	
670	•	•		•	•	BS	
680	•	•		•	•	BS	
690	•	•		•	•	BS	
700	•	•		•	•	BS	
710	•	•		•	•	BS	
720	•	•		•	•	BS	
730	•	•		•	•	BS	
740	•	•		•	•	BS	
750	•	•		•	•	BS	
760	•	•		•	•	BS	
770	•	•		•	•	BS	
780	•	•		•	•	BS	
790	•	•		•	•	BS	
800	•	•		•	•	BS	
810	•	•		•	•	BS	
815	•	•		•	•	BS	
820	FINE SAND	[illegible]		FIRM	MOIST	BS	
830	•	•		•	•	BS	
840	•	•		•	•	BS	
850	•	•		•	•	[illegible]	
860	•	•		•	•	[illegible]	
870	•	•		•	•	[illegible]	
880	•	•		•	•	[illegible]	
890	•	•		•	•	[illegible]	
900	•	•		•	•	[illegible]	
910	•	•		•	•	[illegible]	
920	•	•		•	•	[illegible]	
930	•	•		•	•	[illegible]	
940	•	•		•	•	[illegible]	
950	•	•		•	•	[illegible]	
[illegible]	•	•		•	•	[illegible]	

DEPOSITIONAL ENVIRONMENT: M = Marsh, NL = Natural Levee, IB = Interdistributary Bay, CF = Channel Fill, LD = Lacustrine Delta, MI = Midden, S = Spoil, IN,BS = Inland or Back Swamp, [illegible] Crevasse Channel, ST = Substratum
STRATIGRAPHY: [illegible]

PLATE A19

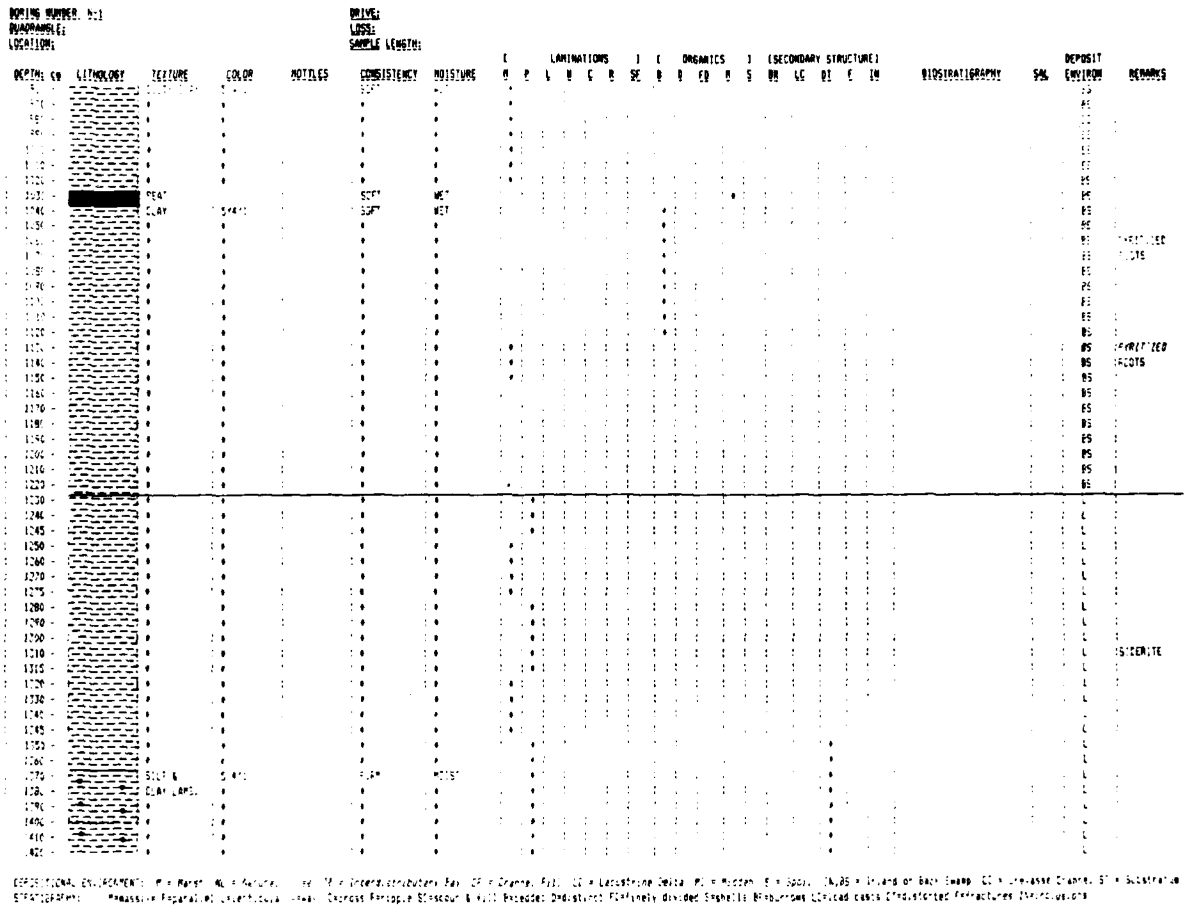
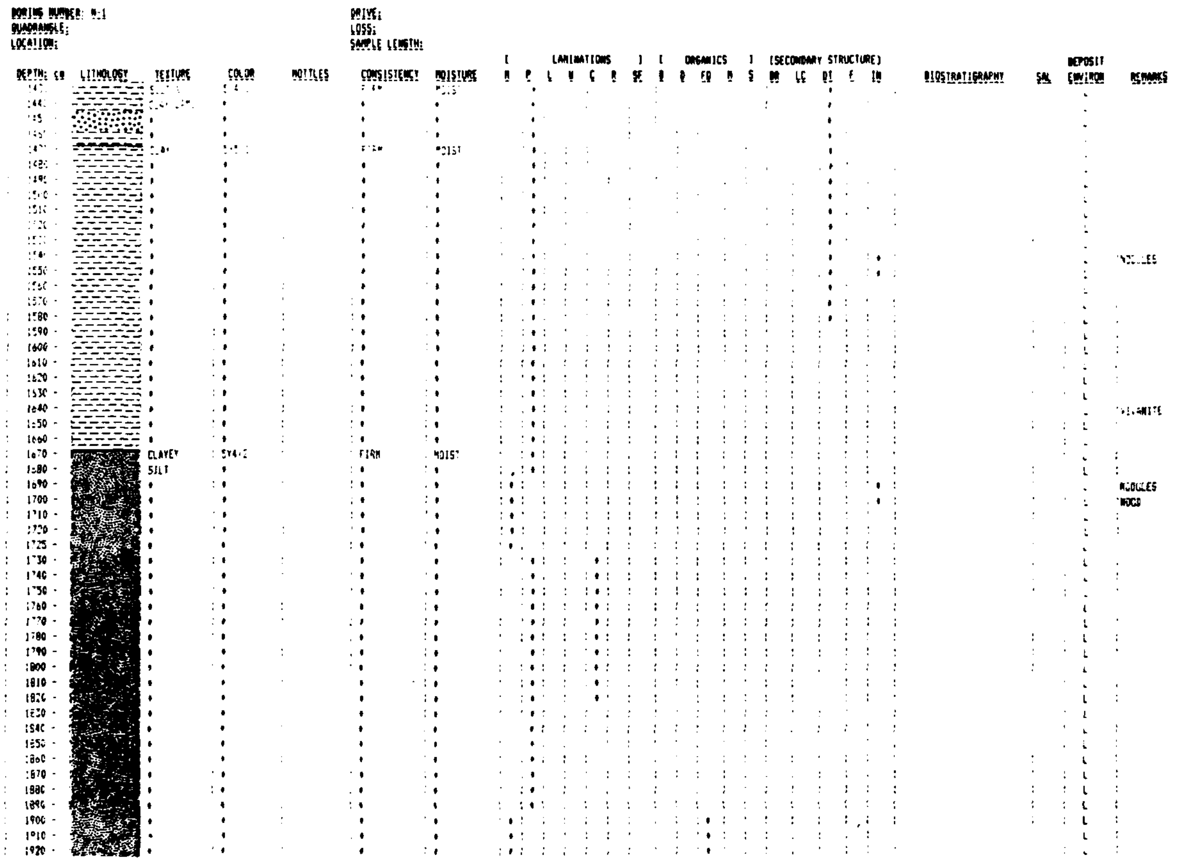

BORING NUMBER
QUADRANGLE:
LOCATION:
DRIVE:
LOSS:
SAMPLE LENGTH:
LAMINATIONS
ORGANICS
(SECONDARY STRUCTURE)
DEPTH: cm
LITHOLOGY
TEXTURE
COLOR
MOTTLES
CONSISTENCY
MOISTURE
BIOSTRATIGRAPHY
SAL
DEPOSIT ENVIRON
REMARKS
PEAT
CLAY
SOFT
WET
SILT &
CLAY LAMS.
MOIST
PYRITIZED
ROOTS
SIDERITE

PLATE A20



DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,FS = Inland or ... Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

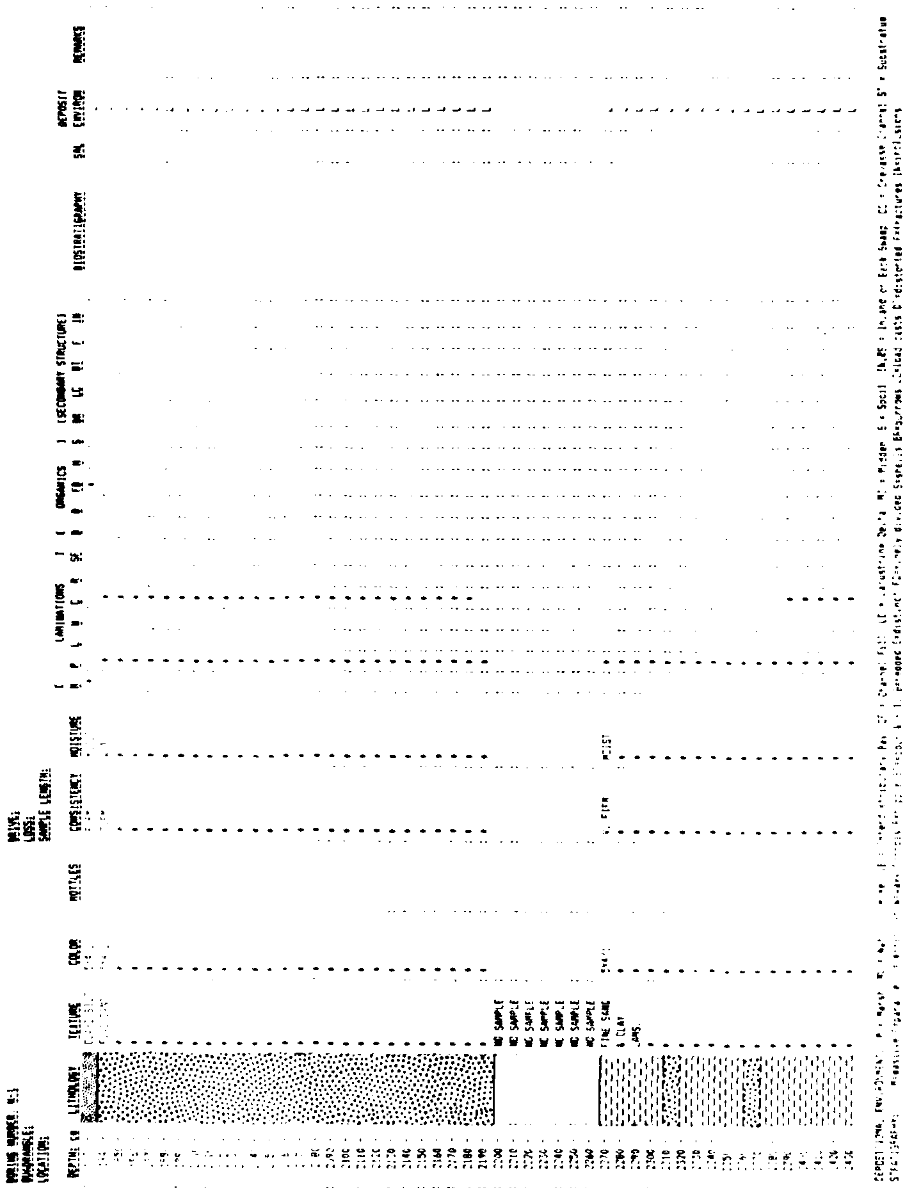

BORING NUMBER: H-1
QUADRANGLE:
LOCATION:
DRIVE:
LOSS:
SAMPLE LENGTH:
DEPTH
LITHOLOGY
TEXTURE
COLOR
MOTTLES
CONSISTENCY
MOISTURE
LAMINATIONS
ORGANICS
(SECONDARY STRUCTURE)
BIOSTRATIGRAPHY
SAL
DEPOSIT ENVIRON
REMARKS
NO SAMPLE
NO SAMPLE
NO SAMPLE
NO SAMPLE
NO SAMPLE
NO SAMPLE
NO SAMPLE
FINE SAND
& CLAY
LAMS.
V. FIRM
MOIST
DEPOSITIONAL ENVIRONMENT:
STRATIGRAPHY:

PLATE A22

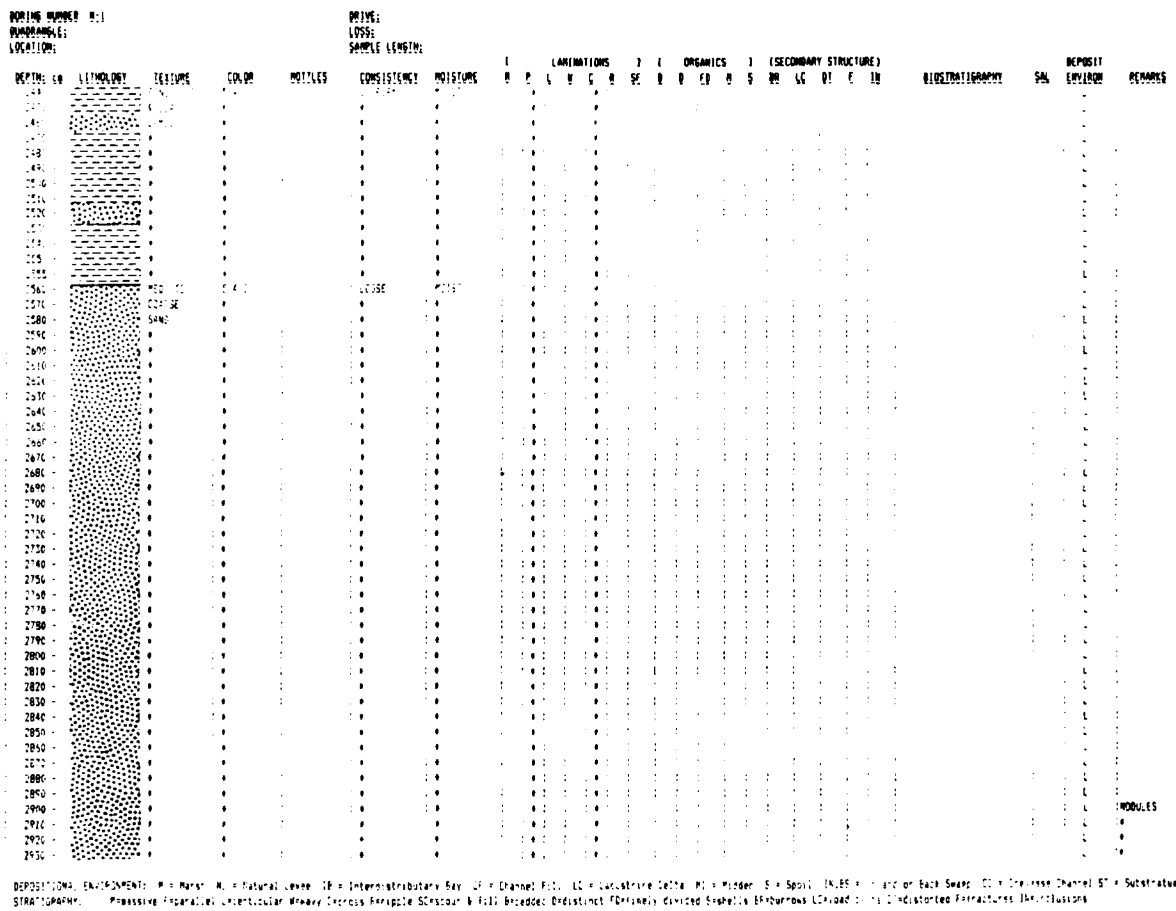
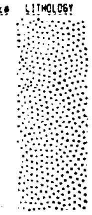

BORING NUMBER
QUADRANGLE:
LOCATION:
DRIVE:
LOSS:
SAMPLE LENGTH:
DEPTH
LITHOLOGY
TEXTURE
COLOR
MOTTLES
CONSISTENCY
MOISTURE
LAMINATIONS
ORGANICS
(SECONDARY STRUCTURE)
BIOSTRATIGRAPHY
SAL
DEPOSIT ENVIRON
REMARKS
LOOSE
COARSE
SAND
NODULES

PLATE A23

PLATE A24

BORING NUMBER: N-1
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:



DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(LAMINATIONS) M	P	L	W	C	R	SE	(ORGANICS) B	D	FD	R	S	(SECONDARY STRUCTURE) BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS

DEPOSITIONAL ENVIRONMENT: M = ... NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M = Massive P = Parallel ... = Lenticular W = Wavy C = Cross R = Ripple SC = Scour & Fill B = Bedded D = Distinct FD = Finely divided S = Shells BR = Burrows LC = Load casts DI = Distorted F = Fractures IN = Inclusions

BORING NUMBER: M-2
QUADRANGLE:
LOCATION: BAYOU SORREL NAT LEV

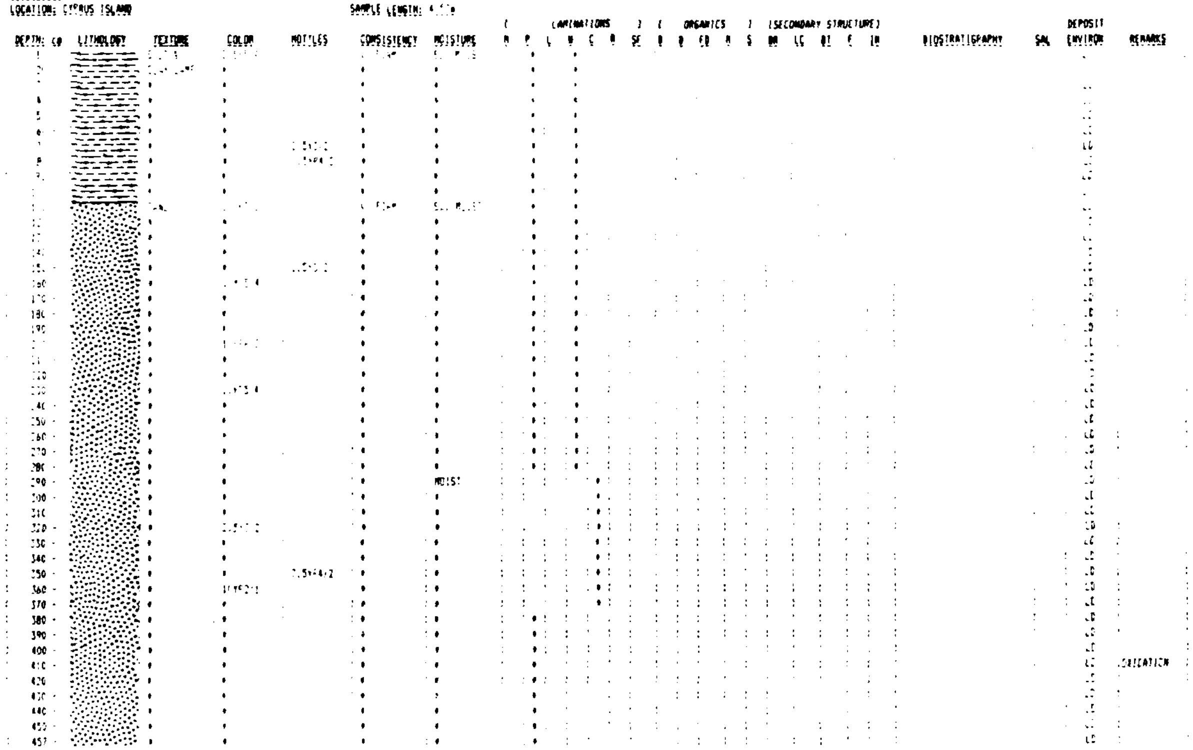
DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS (N P L W C R SF)	B	ORGANICS (R FD W S)	SECONDARY STRUCTURE (BR LC DT F IN)	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
[illegible]		[illegible]	[illegible]		[illegible]	[illegible]							BS	
[illegible]													BS	
[illegible]													BS	
30													BS	
40													BS	
[illegible]													BS	
60			[illegible]		V. FIRM								BS	
70													BS	PYRITIZED
80													BS	ROOTS FROM
90													BS	70-100 cm.
100														

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta ML = Mud S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substrat
STRATIGRAPHY: Massive P = Parallel L = Lenticular W = Wavy C = Cross R = Ripple S = Scour & Fill E = Embedded D = Distinct FD = Finely divided S = Shell B = Burrows LC = Load casts DT = Distorted F = Fractures IN = Inclusions

BORING NUMBER: C-7
QUADRANGLE:
LOCATION: CYPRUS ISLAND

DRIVE:
LOSS:
SAMPLE LENGTH:



DEPOSITIONAL: ... M = Marsh, NL = Natural Levee, IE = Interdistributary Bay, CF = Channel Fill, LC = Lacustrine Delta, MD = Midden, S = Spoil, IN,BS = Inland or Back Swamp, CC = Crevasse Channel, ST = Substratum

STRATIGRAPHY: ... Embedded ... BR = burrows ...

PLATE A26

BORING NUMBER: C-11
QUADRANGLE:
LOCATION: CYPRUS ISLAND

DRIVE:
LOSS:
SAMPLE LENGTH:

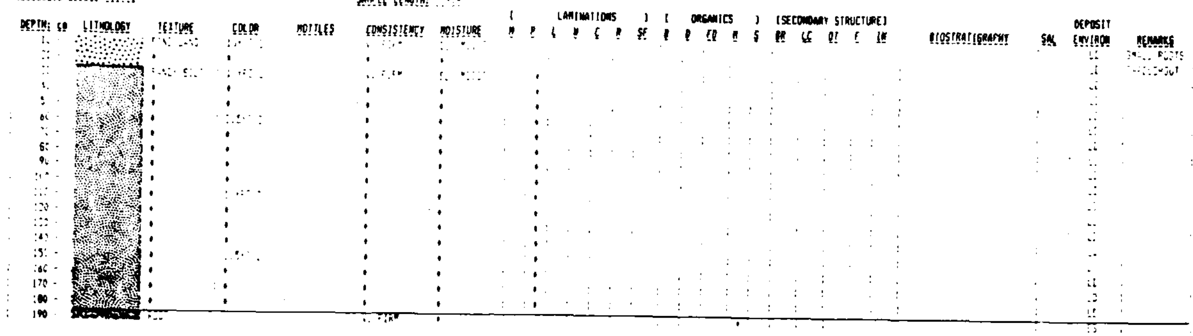
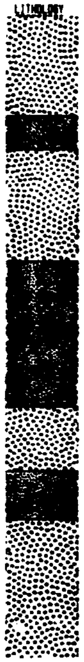


PLATE A27

BORING NUMBER: C-12
[illegible]:
LOCATION: CYPRUS ISLAND

DRIVE: 4.54m
LOSS:
SAMPLE LENGTH: 4.54m



DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SE	ORGANICS R	B	FD	W	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	SILTY SAND	2.5Y[illegible]		V. FIRM	MOIST		•		•	•															LD	
20	(FINE)	•		•	•		•		•	•															LD	
30	•	•		•	•		•		•	•															LD	
40	•	•		•	•		•		•	•															LD	
50	•	2.5Y5/4		•	SL. MOIST		•		•	•															LD	
60	•	•		•	MOIST		•		•	•															LD	
70	SANDY SILT	10YR4/2		V. FIRM	MOIST		•		•																LD	
80	•	•		•	•		•		•																LD	OXIDIZED
90	SILTY SAND	10YR5/2		V. FIRM	MOIST		•		•																LD	
100	(FINE)	•		•	•		•		•																LD	
110	•	•	10YR5/4	•	SL. MOIST		•		•																LD	OXIDIZED
120	•	•	•	•	•		•		•																LD	
130	•	•		•	•		•		•																LD	
140	•	•		•	•		•		•																LD	
150	•	10YR5/4		•	•		•		•																LD	
160	SANDY SILT	10YR5/4		V. FIRM	SL. MOIST		•		•																LD	
170	•	•		•	•		•		•																LD	OXIDIZED
180	•	10YR4/2		•	•		•		•																LD	
190	•	•		•	•		•		•																LD	
200	•	2.5Y3/2		•	•		•		•																LD	
210	•	•		•	•		•		•																LD	
220	•	•		•	•		•		•																LD	
230	•	•		•	•		•		•																LD	
240	•	•		•	•		•		•																LD	
250	SILTY SAND	2.5Y3/2		V. FIRM	SL. MOIST		•		•																LD	
260	(FINE TO	2.5Y4/4		•	•		•		•																LD	
270	MED.)	•		•	•		•		•																LD	
280	•	2.5Y4/2		•	•		•		•																LD	
290	SANDY SILT	2.5Y4/2		V. FIRM	SL. MOIST		•		•																LD	
300	•	•		•	•		•		•																LD	
310	•	•		•	•		•		•																LD	
320	SILTY SAND	2.5Y4/2		V. FIRM	SL. MOIST		•		•	•															LD	
330	•	•		•	•		•		•	•															LD	
340	•	2.5Y4/4		•	•		•		•	•															LD	
350	•	•		•	•		•		•	•															LD	
360	•	[illegible]		•	•		•		•	•															LD	
370	•	•		•	•		•		•																LD	
380	•	•		•	•		•		•	•															LD	
390	•	10YR5/4		•	•		•		•	•															LD	
400	•	•		•	•		•		•	•															LD	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IE = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,EE = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SE=scour & fill embedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A28

BORING NUMBER: C-100
QUADRANGLE: CENTERVILLE
LOCATION: CYPRUS ISLAND

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		SILTY CLAY	[illegible]	7.5YR5/6	V. FIRM	MOIST			NL	[illegible]
20		•	•	•	•	•			NL	
30		•	•	•	•	•			NL	
40		•	•	•	•	•			NL	
50		•	•	•	•	•			NL	
60		SILTY SAND	[illegible]		LOOSE	MOIST			NL	
70		•	•		•	•			NL	
80		•	•		•	•			NL	
90		•	•		•	•			NL	
100		CLAY	[illegible]		V. FIRM	MOIST			NL	
110		SILTY SAND	[illegible]		LOOSE	MOIST			LD	
120		•	•		•	•			LD	
130		CLAY	[illegible]YR4/2		V. FIRM	MOIST			LD	
140		SAND	2.5Y4/2		LOOSE	MOIST			LD	
150		•	•		•	•			LD	
160		SILT &	10YR4/2		V. FIRM	MOIST			LD	
170		CLAY LAMS.	•		•	•			LD	
180		•	•		•	•			LD	
190		•	•		•	•			LD	
200		•	•		•	•			LD	
210		SILT	2.5Y4/2		LOOSE	MOIST			LD	
220		•	•		•	•			LD	
230		•	•		•	•			LD	
240		SILT &	10YR4/2		V. FIRM	MOIST			LD	
250		CLAY LAMS.	•		•	•			LD	
260		•	•		•	•			LD	
270		CLAY	5YR4/3		V. FIRM	MOIST			LD	
280		•	ALTERNATIN		•	•			LD	
290		•	W/2.5Y4/2		•	•			LD	
300		•	•		•	•			LD	
310		•	•		•	•			LD	
320		ORE &	•		•	•			LD	
330		CLAY	•		•	•			LD	
340		•	•		•	•			LD	
350		•	•		•	•			LD	
360		•	•		•	•			LD	
370		SAND	2.5Y4/2		SL. FIRM	MOIST			LD	
380		•	•		•	•			LD	
390		•	•		•	•			LD	
400		•	•		•	•			LD	
410		•	•		•	•			LD	
420		•	•		•	•			LD	
430		•	•		•	•			LD	
440		•	•		•	•			LD	
450		•	•		•	•			LD	
460		SILTY CLAY	10YR4/2		FIRM	MOIST			LD	
470		SILTY SAND	2.5Y4/2		SL. FIRM	MOIST			LD	
480		•	•		•	•			LD	
490		•	•		•	•			LD	
500		•	•		•	•			LD	
510		•	•		•	•			LD	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = [illegible]rrel Fill LD = Lacustrine Delta MI = Midden S = Spoil IM,ES = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A30

BORING NUMBER: C-109
QUADRANGLE: CENTERVILLE
LOCATION: CYPRUS ISLAND

DRIVE: 6.07m
LOSS:
SAMPLE LENGTH: 5.63m

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SC	ORGANICS B	D	FD	R	S	SECONDARY STRUCTURE BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520 -		SILTY SAND	2.5Y4/2		SL. FIRM	MOIST										•										LD	
530 -		•	•		•	•										•										LD	
540 -		•	•		•	•										•										LC	
550 -		•	•		•	•										•										LC	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta RI = Ridden S = Spoil IS,BS = Island or Back Swamp CC = Crevasse Channel ' = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

BORING NUMBER: C-191
QUADRANGLE: CENTERVILLE
LOCATION: CYPRUS ISLAND

DRIVE: 6.00m
LOSS:
SAMPLE LENGTH: 5.19m

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	DEPOSIT ENVIRON	REMARKS
10	SAND	10YR5/4		SL. LOOSE	WET	NL	
20						NL	
30						NL	
40						NL	
50						NL	
60						NL	
70						NL	
80						NL	
90						NL	
100				FIRM		NL	
110						LD	
120						LD	
130						LD	
140						LD	
150		10YR3/2				LD	
160						LD	
170						LD	
180						LD	
190						LD	
200						LD	
210						LD	
220						LD	
230	SILTY CLAY	5YR3/2		FIRM	V. WET	LD	HORIZONTAL
240						LD	
250						LD	
260	SILTY SAND	10YR3/2		V. FIRM	V. WET	LD	
270						LD	
280						LD	
290				LOOSE	WET	LD	
300						LD	
310						LD	
320						LD	
330						LD	
340						LD	
350						LD	
360						LD	
370						LD	
380	CLAY	10YR3/2		FIRM	V. WET	L	HORIZONTAL
390						L	
400						L	
410						L	
420						L	
430			10YR4/2			L	
440						L	
450						L	
460						L	
470						L	
480						L	
490						L	
500						L	
510				V. FIRM	WET	L	

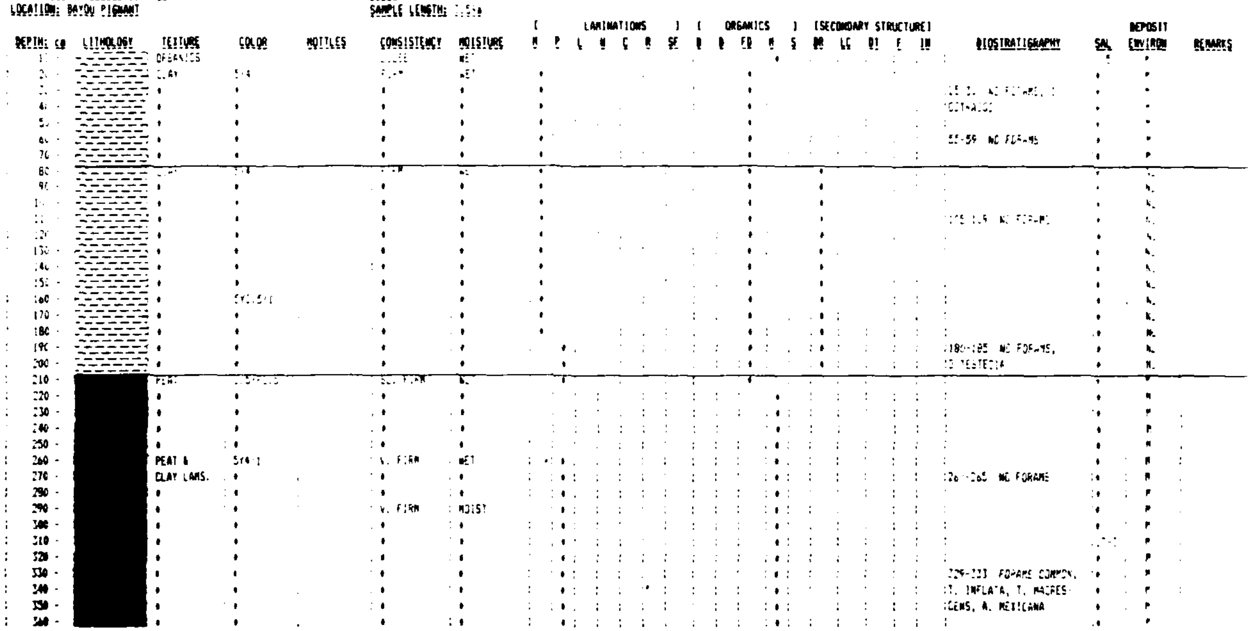
Column headings also printed: LITHOLOGY; [LAMINATIONS] M P L W C R SE; [ORGANICS] D B FD W S; (SECONDARY STRUCTURE) BR LC DT F IN; BIOSTRATIGRAPHY; SAL

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IS,SS = Inland or Back swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple : =scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A31

BORING NUMBER: MC-2
QUADRANGLE: MORGAN CITY SE
LOCATION: BAYOU PIGNANT

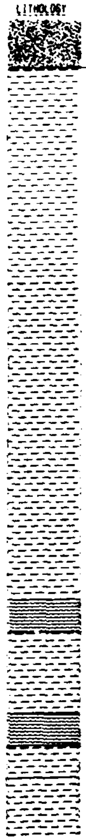
DRIVE: 5.20m
LOSS:
SAMPLE LENGTH: 3.55m



DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

BORING NUMBER: MC-3
QUADRANGLE: MORGAN CITY SE
LOCATION: BAYOU PENCHANT

DRIVE: 6.7m
LOSS:
SAMPLE LENGTH: [illegible]



DEPTH: CM	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	ORGANICS	[illegible]		FIRM	WET		[illegible]	M	
20	•	•		•	•		•	M	
30	•	•		•	•		•	M	
40	ORG CLAY			FIRM	MOIST		•	CF	
50	•	•		•	•		•	CF	
60	•	•		•	•	55-65 FORAMS COMMON, T.	•	CF	
70	•	•		•	•	INFLATA, T. MACRESCENS,	•	CF	
80	•	•		•	•	A. INEPTA, M. FUSCA,	•	CF	
90	•	•		•	•	TESTECIA	•	CF	
100	•	•		•	•		•	CF	
110	•	•		•	•		•	CF	
120	•	•		•	•		•	CF	
130	•	•		•	•		•	CF	
140	•	•		•	•		•	CF	
150	•	•		•	•		•	CF	
160	•	•		•	•	155-160 NO FORAMS	•	CF	
170	•	•		•	•		•	CF	
180	•	•		•	•		•	CF	
190	•	•		•	•		•	CF	
200	•	•		•	•		•	CF	
210	•	•		•	•		•	CF	
220	•	•		•	•		•	CF	
230	•	•		•	•		•	CF	
240	•	•		•	•		•	CF	
250	•	•		•	•		•	CF	
260	•	•		•	•	255-260 FORAMS SPARSE,	•	CF	
270	•	•		•	•	T. MACRESCENS, A.	•	CF	
280	•	•		•	•	INEPTA	•	CF	
290	•	•		•	•		•	CF	
300	•	•		•	•		•	CF	
310	•	•		•	•	300-305 FORAMS SPARSE,	•	CF	
320	•	•		•	•	T. MACRESCENS, A.	•	CF	
330	•	•		•	•	INEPTA, A. SALSUM	•	CF	
340	•	•		•	•		•	CF	
350	•	•		•	•		•	CF	
360	•	•		•	•		•	CF	
370	W/ SHELLS			FIRM	MOIST		5-13	CF	
380	•	•		•	•		•	CF	
390	ORG CLAY	5Y3/1		FIRM	MOIST		5-13	CF	
400	•	•		•	•		•	CF	
410	•	•		•	•		•	CF	
420	•	•		•	•		•	CF	
430	•	•		•	•		•	CF	
440	W/ SHELLS			FIRM	MOIST		5-12	CF	
450	•	•		•	•		•	CF	
460	ORG CLAY	5Y3/1		FIRM	MOIST		5-12	CF	
470	•	•		•	•		•	CF	
480	SILTY CLAY	5Y3/1		FIRM	MOIST	470-475 FORAMS SPARSE,	5-13	CF	
490	•	•		•	•	T. MACRESCENS, H. MA-	•	CF	
500	•	•		•	•	NILAENSIS, A. SALSUM	•	CF	
510	•	•		•	•		•	CF	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Meander S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A33

BORING NUMBER: MC-3
QUADRANGLE: MORGAN CITY SE
LOCATION: BAYOU PENCHANT

DRIVE: 8.70m
LOSS:
SAMPLE LENGTH: 8.40m

							[		LAMINATIONS				]	[		ORGANICS		]	[SECONDARY STRUCTURE]							DEPOSIT	
DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SE	B	D	FD	W	S	BR	LC	BT	F	IN	BIOSTRATIGRAPHY	SAL	ENVIRON	REMARKS
520 -		SILTY CLAY	5Y3/1		FIRM	MOIST		•									•								5-13	CF	
530 -		•	•		•	•		•									•								•	CF	
540 -		•	•		•	•		•									•								•	CF	
550 -		•	•		•	•		•									•								•	CF	
560 -		•	•		•	•		•									•								•	CF	
570 -		•	•		•	•		•		•				•											•	CF	
580 -		•	•		•	•		•		•				•											•	CF	
590 -		•	•		•	•		•		•				•											•	CF	
600 -		•	•		•	•		•		•				•											•	CF	
610 -		•	•		•	•		•		•								•							•	CF	
620 -		•	•		•	•		•		•															•	CF	
630 -		•	•		•	•		•		•														620-625 FORAMS SPARSE,	•	CF	
640 -		CLAY	5Y3/1		V. FIRM	MOIST		•		•														T. IRREGULARIS, R.	5-13	CF	
650 -		•	5Y4/1		•	•		•		•														FUSCA, A. SALSUM	•	CF	
660 -		•	•		•	•		•		•															•	CF	
670 -		•	•		•	•		•		•															•	CF	
680 -		•	5Y5/3		•	•		•		•															•	CF	
690 -		•	•		•	•		•		•															•	CF	
700 -		•	•		•	•		•																	•	CF	
710 -		•	•		•	•		•																	•	CF	
720 -		•	•		•	•		•																	•	CF	
730 -		•	•		•	•		•																	•	CF	
740 -		•	•		•	•		•																	•	CF	
750 -		•	•		•	•		•																	•	CF	
760 -		•	•		•	•		•																	•	CF	
770 -		•	•		•	•		•																	•	CF	
780 -		•	•		•	•		•																	•	CF	
790 -		•	•		•	•		•																	•	CF	
800 -		•	•		•	•		•																	•	CF	
810 -		•	•		•	•		•																	•	CF	
820 -		•	•		•	•		•																	•	CF	
830 -		•	•		•	•		•																	•	CF	
840 -		•	•		•	•		•																835-840 NC FORAMS	•	CF	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland o Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts BT=..torted F=fractures IN=inclusions

PLATE A34

BORING NUMBER: MC-4
QUADRANGLE: MORGAN CITY SE
LOCATION: BAYOU PENCHANT

DRIVE: 6.43m
LOSS:
SAMPLE LENGTH: 6.15m

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	DEPOSIT ENVIRON	REMARKS
10							
20	CLAY	5Y4/1		FIRM	V. MOIST	S	
30						S	
40	ORGANICS	[illegible]		LOOSE	V. MOIST	M	
50						M	
60						M	
70						M	
80	ORGANIC	2.5Y2.5/[illegible]	5 4/1	FIRM	WET	M	
90	CLAY					M	
100						M	
110						M	
120						M	
130						M	
140						M	
150					V. WET	M	
160						M	
170						M	
180	CLAY	5Y4/1		FIRM	V. WET	ID	
190						ID	
200						ID	
210						ID	
220						ID	
230						ID	
240						ID	
250						ID	
260						ID	
270						ID	
280						ID	
290						ID	
300						ID	
310						ID	
320						ID	
330						ID	
340						ID	
350	SHELL HASH	5Y4/1				ID	SHELL HASH
360	CLAY	5Y4/1				ID	
370						ID	
380						ID	
390						ID	MINOR SHELL
400						ID	HASH
410						ID	
420				V. FIRM		ID	
430						ID	
440						ID	
450						ID	
460						ID	
470						ID	
480						ID	
490	SHELL	5Y4/1				ID	SHELL HASH
500						ID	SAND FROM
510	CLAY	5Y4/1				ID	490-495

Column headings also printed: LITHOLOGY; [LAMINATIONS]: M P L W C R SE; [ORGANICS]: B D FD R S; [SECONDARY STRUCTURE]: BR LC DI F IN; BIOSTRATIGRAPHY; SAL

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee ID = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substrate
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A35

BORING NUMBER: MC-4
QUADRANGLE: MORGAN CITY SE
LOCATION: BAYOU PENCHANT

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: (M)	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(LAMINATIONS M	P	L	W	C	R	SF)	(ORGANICS B	D	FD	R	S)	(SECONDARY STRUCTURE) BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
[illegible]		CLAY	[illegible]		[illegible] FIRM	[illegible] WET		•										•								IB	
[illegible]		•	•		•	•		•										•								IB	
[illegible]		•	•		•	•	•											•								IB	
[illegible]		SHELL HASH	[illegible]		LOOSE	MOIST												•								IB	
[illegible]		W CLAY	•		•	•												•								IB	
[illegible]		SILT	[illegible]		EXT. FIRM	MOIST												•								IB	
[illegible]		•	•		•	•												•								IB	
[illegible]		•	•		•	•												•								IB	
[illegible]		•	•		•	•												•								IB	
[illegible]		•	•		•	•												•								IB	
[illegible]		•	•		•	•												•								IB	
[illegible]		•	•		•	•												•									

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta M[illegible] S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A36

BORING NUMBER: MC-3
QUADRANGLE: MORGAN CITY SW
LOCATION: BAYOU CHENE

DRIVE: 4.51m
LOSS:
SAMPLE LENGTH: 4.19m

DEPTH: CM	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	ORGANICS	[illegible]		LOOSE	WET	0-5 NO FORAMS	.5‰	M	
20	•	•		•	•		•	M	
30	ORG CLAY	[illegible]		FIRM	WET		.5‰	M	PYRITE
40	•	•		•	•		•	M	
50	•	•		•	•		•	M	
60	•	•		•	•	50-55 NO FORAMS	•	M	
70	•	•		•	•		•	M	
80	•	•		•	•		•	M	
90	•	•		•	•		•	M	
100	•	•		•	•		•	M	
110	•	•		•	•		•	M	
120	•	•		•	•		•	M	
130	•	•		V. FIRM	•		•	M	
140	•	•		•	•		•	M	
150	•	•		•	•		•	M	
160	•	•		LOOSE	•		•	M	
170	•	•		•	•		•	M	
180	•	•		FIRM	•		•	M	
190	•	5Y [illegible]		•	•		•	M	
200	•	•		V. FIRM	•		•	M	
210	•	5Y4/1		•	•	200-205 NO FORAMS	•	M	
220	•	•		•	•		•	M	
230	•	[illegible]		•	•		•	M	
240	•	•		•	•		•	M	
250	•	•		•	•		•	M	
260	•	•		FIRM	•	250-255 NO FORAMS	•	M	
270	•	5Y5/1		•	•		•	M	
280	•	•		•	•		•	M	
290	•	•		•	•		•	M	
300	•	•		•	•	295-300 NO FORAMS	•	M	
310	CLAY	5Y5/1		V. FIRM	MOIST		•	NL	
320	•	•		STIFF	•		•	NL	
330	•	•		•	•	320-325 NO FORAMS	•	NL	PYRITE &
340	•	•		•	•		•	NL	IRON OXIDE
350	•	•		•	•		•	NL	
360	•	•		•	•		•	NL	
370	•	•		•	•		•	NL	
380	•	•		•	•		•	NL	
390	•	•		•	•		•	NL	
400	•	•		•	•		•	NL	
410	•	•		•	•	400-405 NO FORAMS	•	NL	
420	•	•		•	•		•	NL	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LC = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=Massive P=Parallel L=Lenticular W=Wavy C=Cross R=Ripple SC=Scour & Fill B=Bedded D=Distinct FD=Finely Divided S=Shells BU=Burrows LC=Lead Casts DI=Distorted F=Fractures IN=Inclusions

PLATE A37

BORING NUMBER: NC-[illegible]
QUADRANGLE: [illegible] CITY
LOCATION: [illegible] ISLAND

DRIVE: 4.1?M
LOGS:
SAMPLE LENGTH: 3.87M

DEPTH cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SC	ORGANICS B	D	FD	W	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		ORG CLAY	10YR5/8		1.FIRM	MOIST	•									•								10-15 NO FORAMS	<5	NL	
20							•									•										NL	PYTR ROOTS
30							•									•										NL	•
40							•									•			•							NL	•
50							•									•			•							NL	•
60							•									•			•					62-68 NO FORAMS		NL	•
70							•									•			•							NL	•
80							•									•			•							NL	•
90							•									•			•							NL	•
100		CLAY	5YR2.5/0		FIRM	V. MOIST	•												•							NL	•
110							•												•							NL	•
120			10YR3/1				•												•							NL	•
130							•												•							NL	•
140							•												•							NL	•
150							•												•					158-162 NO FORAMS		NL	•
160							•												•							NL	•
170							•												•							NL	•
180							•												•							NL	•
190		SILTY SAND	5Y3/2		FIRM	MOIST		•		•						•								187-193 A.salsum		NL	•
200								•		•						•										NL	•
210								•		•						•										NL	•
220								•		•						•										NL	•
230								•		•						•										NL	•
240								•		•					•											NL	•
250		CLAY	5Y3/2		FIRM	MOIST	•																	257-262 NO FORAMS		NL	•
260							•																			NL	•
270		PEAT			FIRM	MOIST								•			•									M	
280														•			•							287-291 FORAMS		M	
290														•			•							sparse, mostly		M	
300														•			•							T. Macrescents		M	
310														•			•									M	
320														•			•									M	
330		CLAY	10YR5/1		FIRM	MOIST	•								•									322-330 WOOD		NL	
340							•								•											NL	
350							•								•											NL	PYRT ROOTS
360							•								•											NL	•
370							•								•											NL	•
380							•								•											NL	•
390							•								•									382-387 A.mexicanum		NL	•

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A38

BORING NUMBER: MC-7
QUADRANGLE: MORGAN CITY SE
LOCATION:

DRIVE: 7.53m
LOSS:
SAMPLE LENGTH: 7.27m

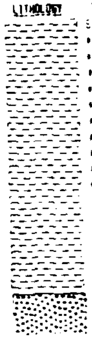
DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		ORGANICS	5YR2.5/1		LOOSE	V. WET	-5 NO FORAMS		P	
20		•	•		•	•			M	
30		•	•		•	•			M	
40		•	•		•	•			M	
50		•	•		•	•			M	
60		•	•		•	•			P	
70		CLAY	5Y3/1		FIRM	WET			M	
80		•	•		•	•	78-82 1 T.MACRESCENS		M	
90		•	•		•	•			M	
100		•	•	2.5YR5/6	•	•			M	
110		•	5Y3/2		•	•			L	
120		•	•		•	•			L	
130		•	•		•	•			L	
140		•	•		•	•	132-136 NO FORAMS		L	
150		•	•		•	•			L	
160		•	•		•	•			L	
170		SILTY CLAY	5Y3/2		FIRM	WET			L	
180		•	•		•	•			L	
190		•	•		•	•			L	
200		•	•		•	•			L	
210		•	•		•	•	200-207 NO FORAMS		L	
220		•	•		•	•			L	
230		SAND	5Y3/2		FIRM	WET			L	
240		SILTY CLAY	5Y3/2		FIRM	WET			L	
250		•	•		•	•			L	
260		•	•		•	•	252-257 NO FORAMS		L	
270		•	•		•	•			L	
280		•	•		•	•			L	
290		•	•		V. FIRM	MOIST			L	
300		•	•		•	•			L	
310		•	•		•	•			L	
320		SAND	2.5Y4/2		V. FIRM	MOIST			L	
330		SILTY CLAY	2.5Y4/2		V. FIRM	MOIST			L	
340		•	•		•	•			L	
350		•	•		•	•			L	
360		•	•		•	•			L	
370		SAND	2.5Y4/2		V. FIRM	MOIST			L	
380		•	•		•	•			L	
390		SILTY CLAY	2.5Y4/2		FIRM	MOIST			L	
400		•	•		•	•			L	
410		SAND	2.5Y4/2		V. FIRM	MOIST	407-412 NO FORAMS		L	
420		SILTY CLAY	2.5Y4/2		V. FIRM	MOIST			L	
430		•	•		•	•			L	
440		•	•		•	•			L	
450		•	•		•	•			L	
460		SAND	2.5Y4/2		V. FIRM	MOIST			L	
470		SILTY CLAY	2.5Y4/2		FIRM	MOIST			L	
480		•	•		•	•			L	
490		•	•		•	•			L	
500		SAND	2.5Y4/2		V. FIRM	MOIST			L	
510		SILTY CLAY	2.5Y4/2		FIRM	MOIST			L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LC = Lacustrine D = Delta Mi = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=faint DI=divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A40

BORING NUMBER: MC-7
QUADRANGLE: MORGAN CITY SE
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(M	P	LAMINATIONS L	W	C	R	SF)	(B	ORGANICS D	FD	M	S)	(SECONDARY STRUCTURE) BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520		SILTY CLAY																									
540																											
560																											
580																											
590																											
640																											
650																											
660																											
670																											
680		SAND			V. FIRM	MOIST																					
690																									700-705 NO FORAMS			
700																											
705																											

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IS,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=root casts DI=distorted F=fractures IN=inclusions

BORING NUMBER: E-2
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(LAMINATIONS) M P L W C R SF	(ORGANICS) B P FD W S	(SECONDARY STRUCTURE) BR LC DT F IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]	
[illegible]		NO SAMPLE											
[illegible]		SILTY CLAY	[illegible]	[illegible]	[illegible] FIRM	SL. MOIST						NL	
[illegible]		NO SAMPLE											
[illegible]		SILTY CLAY	[illegible]	[illegible]	[illegible] FIRM	SL. MOIST						NL	
300			5Y4/1									NL	
310		NO SAMPLE											
320		SILTY CLAY	5Y4/1		V. FIRM	MOIST						NL	
370		SILTY CLAY	5Y4/1		V. FIRM	MOIST						NL	
460		SILTY CLAY	5Y4/1		V. FIRM	MOIST						NL	
500			5Y4/1									NL	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel [illegible]

STRATIGRAPHY: [illegible]

BORING NUMBER: 6-3
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH	C#	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SE	ORGANICS P	D	FD	W	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520			SILTY CLAY	5Y4/[illegible]		V. FIRM	MOIST																	*			NL	
530			*	*		*	*																	*			NL	
540			*	*		*	*																	*			NL	
550			NO SAMPLE																									
560			NO SAMPLE																									
570			NO SAMPLE																									
580			NO SAMPLE																									
590			NO SAMPLE																									
600			NO SAMPLE																									
610			NO SAMPLE																									
620			NO SAMPLE																									
630			NO SAMPLE																									
640			NO SAMPLE																									
650			NO SAMPLE																									
660			NO SAMPLE																									
670			NO SAMPLE																									
680			SILTY CLAY	5Y3/2		V. FIRM	SL. MOIST																				CC	
690			*	*		*	*																				CC	
700			*	*		*	*																				CC	
710			*	*		*	*																				CC	
720			*	*		*	*																				CC	
730			*	*		*	*																				CC	
740			*	*		*	MOIST																				CC	
750			*	*		*	*																				CC	
760			*	*		*	*																				CC	
770			SAND	5Y5/3		V. FIRM	MOIST																				CC	
780			SILTY CLAY	5Y3/2		V. FIRM	MOIST																				CC	
790			*	*		*	*																				CC	
800			SAND	5Y5/2		FIRM	MOIST																				CC	
810			*	*		*	*																				CC	
820			*	*		*	*																				CC	
830			*	*		*	*																				CC	
840			NO SAMPLE																									
850			NO SAMPLE																									
860			SAND	5Y4/2		V. FIRM	MOIST																				CC	
870			NO SAMPLE																									
880			NO SAMPLE																									
890			NO SAMPLE																									
900			NO SAMPLE																									
910			NO SAMPLE																									
920			SAND	5Y5/2		V. FIRM	MOIST																				CC	
930			*	*		*	*																				CC	
940			*	*		*	*																				CC	
950			*	*		*	*																				CC	
960			*	*		*	*																				CC	
970			*	*		*	*																				CC	
980			*	*		*	*																				CC	
990			NO SAMPLE																									
1000			NO SAMPLE																									
1010			NO SAMPLE																									
1020			NO SAMPLE																									

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LC = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = [illegible]
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill E=embedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A42

BORING NUMBER: 6-3
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

							LAMINATIONS							ORGANICS				SECONDARY STRUCTURE								
DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SE	D	FD	H	S	BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1030		NO SAMPLE																								
1040		ORG CLAY	5Y4/1		V. FIRM	SL. MOIST																			IS	
1050		•	•		•	•																			IS	
1060		•	•		•	•																			IS	
1070		•	•		•	•																			IS	
1080		•	5Y2.5/1		•	•																			IS	
1090		•	•		•	•																			IS	
1100		NO SAMPLE																								
1110		CLAY	5Y4/1	7.5YR2/0	V. FIRM	MOIST																			IS	
1120		•	•	•	•	•																			IS	
1130		•	•	•	•	•																			IS	
1140		•	•	•	•	•																			IS	
1150		SILTY CLAY	5Y4/1		V. FIRM	MOIST																			IS	
1160		NO SAMPLE																								
1170		ORG CLAY	5Y4/1		V. FIRM	MOIST																			IS	
1180		•	•		•	•																			IS	
1190		SILTY CLAY	5Y4/1		V. FIRM	MOIST																			IS	
1200		CLAY	5Y4/1		V. FIRM	MOIST																			IS	
1210		•	•		•	•																			IS	
1220		•	•		•	•																			IS	
1230		•	•		•	•																			IS	
1240		•	•		•	•																			IS	
1250		•	•		•	•																			IS	
1260		ORG CLAY	5Y4/1		V. FIRM	MOIST																			IS	
1270		NO SAMPLE																								
1280		NO SAMPLE																								
1290		CLAY W/	5Y4/1	7.5YR2/0	V. FIRM	MOIST																			IS	
1300		WOOD ROOTS	•	•	•	•																			IS	
1310		& SMALLER	•	•	•	•																			IS	
1320		PIECES OF	•	•	•	•																			IS	
1325		WOOD	•	•	•	•																			IS	
1330		NO SAMPLE																								
1340		NO SAMPLE																								
1350		CLAY W/	5Y4/1	7.5YR2/0	V. FIRM	MOIST																			IS	
1360		WOOD ROOTS	•	•	•	•																			IS	
1370		ORG CLAY	•	•	•	•																			IS	
1380		•	•	•	•	•																			IS	
1390		•	•	2.5Y4/4	•	•																			IS	
1400		•	•	•	•	•																			IS	
1410		CLAY	5Y4/1		V. FIRM	MOIST																			IS	
1420		•	•		•	•																			IS	
1430		•	•		•	•																			IS	
1440		•	•		•	•																			IS	
1450		ORG CLAY	•		•	•																			IS	
1460		•	•		•	•																			IS	
1470		•	•		•	•																			IS	
1480		CLAY	5Y4/1		V. FIRM	MOIST																			IS	
1490		•	•		•	•																			IS	
1500		•	•		•	•																			IS	
1510		•	•		•	•																			IS	
1520		ORG CLAY	5Y2.5/1		V. FIRM	MOIST																			IS	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay C = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,IS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SE=scour & B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: E-3
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	I M	LAMINATIONS P	L	W	C	R	SE	ORGANICS B	D	FD	M	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1530		CFS CLAY	5Y4/1		V. FIRM	MOIST																					
1540		"	"		"	"																					
1550		"	"		"	"																					
1560		"	"		"	"																					
1570		CLAY	5Y4 1		V. FIRM	MOIST																					
1580		"	"		"	"																					
1590		"	"		"	"																					
1600		"	"		"	"																					
1610		"	"		"	"																					
1620		"	"		"	"																					
1630		CFS CLAY	"		"	"																					
1640		"	"		"	"																					
1650		"	"		"	"																					
1660		"	"		"	"																					
1670		"	"		"	"																					
1680		CLAY	5Y4 1		V. FIRM	MOIST																					
1690		"	"		"	"																					
1700		"	"		"	"																					
1710		"	"		"	"																					
1720		"	"		"	"																					
1730		"	"		"	"																					
1740		"	"		"	"																					
1750		"	"		"	"																					
1760		"	"		"	"																					
1770		"	"		"	"																					
1780		NO SAMPLE																									
1790		NO SAMPLE																									
1800		NO SAMPLE																									
1810		NO SAMPLE																									
1820		NO SAMPLE																									
1830		NO SAMPLE																									
1840		CLAY W	5Y4 1		V. FIRM	MOIST																					
1850		SILT LENSE	"		"	"																					
1860		"	"		"	"																					
1870		SILTY CLAY	5Y4 2		V. FIRM	MOIST																					
1880		NO SAMPLE																									
1890		NO SAMPLE																									
1900		CLAY	5Y4 1		V. FIRM	MOIST																					
1910		"	"		"	"																					
1920		"	"		"	"																					
1930		"	"		"	"																					
1940		"	"		"	"																					
1950		NO SAMPLE																									
1960		CLAY W	5Y4 1		V. FIRM	MOIST																					
1970		SILT LENSE	"		"	"																					
1980		"	"		"	"																					
1990		"	"		"	"																					
2000		"	"		"	"																					
2010		"	"		"	"																					
2020		"	"		"	"																					
2030		"	"		"	"																					

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee [illegible]

STRATIGRAPHY: Massive [illegible]

PLATE A44

BORING NUMBER: 6-3
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH	CO	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(LAMINATIONS) M P L W C R	SE	(ORGANICS) R FD W	(SECONDARY STRUCTURE) S BR LC DT F IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
2040		CLAY W	5Y4 1		V. FIRM	MOIST							L	
2050		SILT LENSE	"		"	"							L	
2060		"	"		"	"							L	
2070		"	"		"	"							L	
2080		"	"		"	"							L	
2090		"	"		"	"							L	
2100		"	"		"	"							L	
2110		"	"		"	"							L	
2120		"	"		"	"							L	
2130		"	"		"	"							L	
2140		"	"		"	"							L	
2150		"	"		"	"							L	
2160		"	"		"	"							L	
2170		"	"		"	"							L	
2180		"	"		"	"							L	
2190		"	"		"	"							L	
2200		"	"		"	"							L	
2210		"	"		"	"							L	
2220		"	"		"	"							L	
2230		"	"		"	"							L	
2240		"	"		"	"							L	
2250		"	"		"	"							L	
2260		CLAY	5Y4 1		V. FIRM	MOIST							L	
2270		CLAY W/	"		"	"							L	
2280		SILT LENSE	"		"	"							L	
2290		"	"		"	"							L	
2300		"	"		"	"							L	
2310		"	"		"	"							L	
2320		"	"		"	"							L	
2330		"	"		"	"							L	
2340		"	"		"	"							L	
2350		CLAY	5Y4 1		V. FIRM	MOIST							L	
2360		"	"		"	"							L	
2370		NO SAMPLE												
2380		CLAY	5Y4/1		V. FIRM	MOIST							L	
2390		"	"		"	"							L	
2400		"	"		"	"							L	
2410		SILTY CLAY	5Y4/1		V. FIRM	MOIST							L	
2420		"	"		"	"							L	
2430		"	"		"	"							L	
2440		"	"		"	"							L	
2450		"	"		"	"							L	
2460		"	"		"	"							L	
2470		CLAY W/	"		"	"							L	
2480		SILT LENSE	5Y4 1		"	"							L	
2490		"	"		"	"							L	
2500		NO SAMPLE												
2510		CLAY W	5Y4 1		V. FIRM	MOIST							L	
2520		SILT LENSE	"		"	"							L	
2530		"	"		"	"							L	
2540		"	"		"	"							L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IE = Interdistributary Bay CF = Channel Fill LC = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross bed SC=scour & fill B=bedded D=distinct FD=finely divided S=shells B=burrows LC=lead casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: 6-3
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: CO	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SF	ORGANICS B	W	FD	R	S	SECONDARY STRUCTURE BR	LC	DT	F	IR	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
2550 -		SILTY CLAY	5Y4/1		V. FIRM	MOIST																					L	
2560 -		NO SAMPLE																										
2570 -		SILTY CLAY	5Y4/1		V. FIRM	MOIST																					L	
2580 -		w SILT	•		•	•																					L	
2590 -		LENSES	•		•	•																					L	
2600 -			•		•	•																					L	
2610 -			•		•	•																					L	
2620 -		NO SAMPLE																										
2630 -		CLAY w	5Y4/1		V. FIRM	MOIST																					L	
2640 -		SILT LENSE	•	5Y6/4	•	•																					L	
2650 -		•	•	•	•	•																					L	
2660 -		•	•	•	•	•																					L	
2670 -		•	•		•	•																					L	
2680 -		•	•		•	•																					L	
2690 -		•	•		•	•																					L	
2700 -		•	•		•	•																					L	
2710 -		•	•		•	•																					L	
2720 -		•	•		•	•																					L	
2730 -		•	•		•	•																					L	
2740 -		•	•		•	•																					L	
2750 -		•	•		•	•																					L	
2760 -		•	•		•	•																					L	
2770 -		•	•		•	•																					L	
2780 -		•	•		•	•																					L	
2790 -		•	•		•	•																					L	
2800 -		NO SAMPLE																										
2810 -		SILTY CLAY	5Y4/1		V. FIRM	MOIST																					L	
2820 -		•	•		•	•																					L	
2830 -		•	•		•	•																					L	
2840 -		•	•		•	•																					L	
2850 -		•	•		•	•																					L	
2860 -		•	•		•	•																					L	
2870 -		•	•		•	•																					L	
2880 -		•	•		•	•																					L	
2890 -		•	•		•	•																					L	
2900 -		•	•		•	•																					L	
2910 -		•	•		•	•																					L	
2920 -		•	•		•	•																					L	
2930 -		•	•		•	•																					L	
2940 -		•	•		•	•																					L	
2950 -		•	•		•	•																					L	
2960 -		•	•		•	•																					L	
2970 -		•	•		•	•																					L	
2980 -		•	•		•	•																					L	
2990 -		NO SAMPLE																										
3000 -		SILTY CLAY	5Y3/1		V. FIRM	WET																					L	
3010 -		•	•		•	•																					L	
3020 -		•	•	5Y2.5/2	•	•																					L	
3030 -		•	•	•	•	•																					L	
3040 -		PEAT	5Y3/1	5Y2.5/2	V. FIRM	WET																					M	
3050 -		PEAT	5Y3/1	5Y2.5/2	V. FIRM	WET																					M	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IR=inclusions

PLATE A46

BORING NUMBER: B-4
QUADRANGLE: [illegible]
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH, FT	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SC	B	D	FD	S	S	BR	LC	DT	F	IN	STRATIGRAPHY	SAL.	DEPOSIT ENVIRON	REMARKS
10		CLAY	2.5Y4/2	7.5YR4/6	V. FIRM	SL. MOIST	•												•				•			NL	
20		"	"	"	"	"	•												•				•			NL	
30		SILTY CLAY	2.5Y4/2	7.5YR4/6	V. FIRM	SL. MOIST	•												•				•			NL	
40		NO SAMPLE																									
50																											
60																											
70																											
80		ORG CLAY	2.5YR2.5/0		V. FIRM	SL. MOIST	•												•				•			NL	
90		W/ROOTLETS	"		"	"	•												•				•			NL	
100		"	"		"	"	•												•				•			NL	
110		SILTY CLAY	2.5Y4/4		V. FIRM	SL. MOIST	•												•				•			NL	
120		NO SAMPLE																									
130																											
140																											
150																											
160		SILTY CLAY	2.5Y4/2		V. FIRM	SL. MOIST	•												•				•			NL	
170		CLAY	5Y4/1	7.5YR4/6	V. FIRM	SL. MOIST	•												•				•			NL	
180		"	"	"	"	"	•												•				•			NL	
190		"	"		"	"	•												•				•			NL	
200		"	"		"	"	•												•				•			NL	
210		NO SAMPLE																									
220																											
230																											
240		SILTY CLAY	2.5Y4/2	7.5YR4/6	V. FIRM	SL. MOIST	•												•				•			NL	
250		CLAY	5Y4/2		V. FIRM	SL. MOIST	•												•				•			NL	
260		"	"		"	"	•												•				•			NL	
270		"	"		"	"	•												•				•			NL	
280		NO SAMPLE																									
290																											
300																											
310		CLAY	5Y4/2		V. FIRM	MOIST	•												•							NL	
320		"	"		"	"	•												•							NL	
330		"	"		"	"	•												•							NL	
340		"	"		"	"	•												•							NL	
350		"	"		"	"	•												•							NL	
360		"	"		"	"	•																			NL	
370		NO SAMPLE																									
380																											
390		ORG CLAY	5Y4/1		V. FIRM	MOIST	•																			NL	
400		"	"		"	"		•							•								•			M	PYRITE
410		"	"		"	"		•							•								•			M	
420		"	"		"	"		•							•								•			M	
430		"	"		"	"		•							•								•			M	
440		"	"		"	"		•							•								•			M	
450		NO SAMPLE																									
460																											
470		ORGANIC CLAY	"																							M	
480			"																							M	
490			"																							M	
500			"																							M	
510			"																							M	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee ID = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta RI = Ridden S = Spoil IB,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: G-4
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SC	B	D	FD	S	BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
320			"																						M	
330			"																						M	
340		SILTY CLAY	5Y4/1		FIRM	WET	"																		L	
350		"	"		"	"	"																		L	
360		"	"		V. FIRM	MOIST	"																		L	
370		"	5Y4/2		"	"	"																		L	
380		"	"		"	"	"																			
390		"	"		"	"	"																			
600		"	"		"	"	"																			
610		NO SAMPLE																								
620		SILTY CLAY	5Y4/1		V. FIRM	MOIST	"																		L	
630		"	"		"	"	"																		L	
640		"	"		"	"	"																		L	
650		"	"		"	"	"																		L	
660		"	"		"	"	"																		L	
670		NO SAMPLE																								
680																										
690		SILTY CLAY	5Y4/1		V. FIRM	MOIST	"																		L	
700		"	"		"	"	"																		L	
710		"	"		"	"	"																		L	
720		"	"		"	"	"																		L	
730		"	"		"	"	"																		L	
740		"	"		"	"	"																		L	
750		NO SAMPLE																								
760																										
770		SLIGHTLY	5Y4/1		V. FIRM	MOIST	"																		L	
780		SILTY CLAY	"		"	"	"																		L	
790		"	"		"	"	"																		L	
800		"	"		"	"	"																		L	
810		"	"		"	"	"																		L	
820		CLAY SILT	2.5Y4/2		V. FIRM	MOIST	"																		L	
830		NO SAMPLE																								
840																										
850		CLAYEY	2.5Y5/2		V. FIRM	SL. MOIST	"																		L	
860		SILT	"		"	"	"																		L	
870		SILTY CLAY	2.5Y5/2		V. FIRM	SL. MOIST	"																		L	
880		"	2.5Y4/2		"	"	"																		L	
890		SILTY CLAY	5Y4/1		V. FIRM	MOIST	"																		L	
900		"	"		"	"	"																		L	
910		NO SAMPLE																								
920		SILT	2.5Y5/2		V. FIRM	MOIST	"																		L	
930		CLAY	2.5Y4/2		V. FIRM	MOIST	"																		L	
940		"	"		"	"	"																		L	
950		"	"		"	"	"																		L	
960		"	"		"	"	"																		L	
970		"	"		"	"	"																		L	
[illegible]		"	"		"	"	"																		L	
980		NO SAMPLE																								
990																										
1000		SILTY CLAY	2.5Y4/2		V. FIRM	MOIST	"																		L	
1010		"	"		"	"	"																		L	

DEPOSITIONAL ENVIRONMENT: M = Marsh ML = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A48

BORING NUMBER: G-4
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	DEPOSIT ENVIRON
520		NO SAMPLE						
530		NO SAMPLE						
540		SILTY CLAY	5Y4/1		FIRM	WET	•	
550		•	•		•	•	•	
560		•	•		V. FIRM	MOIST	•	
570		•	5Y4/2		•	•	•	
580		•	•		•	•	•	
590		•	•		•	•	•	
600		•	•		•	•	•	
610		NO SAMPLE						
620		SILTY CLAY	5Y4/1		V. FIRM	MOIST	•	
630		•	•		•	•	•	
640		•	•		•	•	•	
650		•	•		•	•	•	
660		•	•		•	•	•	
670		NO SAMPLE						
680		NO SAMPLE						
690		SILTY CLAY	5Y4/1		V. FIRM	MOIST	•	L
700		•	•		•	•	•	L
710		•	•		•	•	•	L
720		•	•		•	•	•	
730		•	•		•	•	•	L
740		•	•		•	•	•	L
750		NO SAMPLE						
760		NO SAMPLE						
770		SLIGHTLY	5Y4/1		V. FIRM	MOIST	•	L
780		SILTY CLAY	•		•	•	•	L
790		•	•		•	•	•	L
800		•	•		•	•	•	
810		•	•		•	•	•	
820		CLAY SILT	2.5Y4/2		V. FIRM	MOIST	•	L
830		NO SAMPLE						
840		NO SAMPLE						
850		CLAYEY	2.5Y5/2		V. FIRM	SL. MOIST	•	L
860		SILT	•		•	•	•	L
870		SILTY CLAY	2.5Y5/2		V. FIRM	SL. MOIST	•	L
880		•	2.5Y4/2		•	•	•	
890		SILTY CLAY	5Y4/1		V. FIRM	MOIST	•	L
900		•	•		•	•	•	L
910		NO SAMPLE						
920		SILT	2.5Y5/2		V. FIRM	MOIST	•	
930		CLAY	2.5Y4/2		V. FIRM	MOIST	•	
940		•	•		•	•	•	L
950		•	•		•	•	•	
960		•	•		•	•	•	
970		•	•		•	•	•	
975		•	•		•	•	•	
980		NO SAMPLE						
990		NO SAMPLE						
1000		SILTY CLAY	2.5Y4/2		V. FIRM	MOIST	•	L
1010		•	•		•	•	•	L

Other column headings: (M P L W C R) LAMINATIONS SE (B ORGANICS FD M S) (SECONDARY STRUCTURE BR LC DI F IN) BIOSTRATIGRAPHY SAL REMARKS

DEPOSITIONAL ENVIRONMENT: P = M... N = Natural Levee IF = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MS = Mudsen S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=Massive P=Parallel ... S=Scour B=... BR=Bedded Distinct F=Finely divided Shells BR=Burrows LC=Load casts DI=Distorted F=Fractures IN=Inclusions

BORING NUMBER: 5-4
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(LAMINATIONS M	P	L	W	C	R	SE)	(ORGANICS B	D	FD	W	S)	(SECONDARY STRUCTURE) BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1020		SILTY CLAY	2.5Y4/2		V. FIRM	MOIST	•																			L	
1030		•	•		•	•	•																			L	
1040		•	•		•	•	•																			L	
1050		•	•		•	•	•																			L	
1060		•	•		•	•	•																			L	
1065		NO SAMPLE																									
1070		CLAY	[illegible]		V. FIRM	MOIST	•																			L	
1080		•	•		•	•	•																	•			L	IRON OXIDE
1090		•	•		•	•	•																			L	INCRUSTATION
1100		•	•		•	•	•																			L	
1110		•	•		•	•	•																			L	
1120		•	•		•	•	•																			L	
1130		•	2.5Y4/2		•	•	•																	•			L	IRON OXIDE
1140		•	•		•	•	•																	•			L	INCRU-
1150		•	•		•	•	•																	•			L	STATIONS
1160		NO SAMPLE																									
1170		NO SAMPLE																									
1180		NO SAMPLE																									
1190		NO SAMPLE																									
1200		NO SAMPLE																									
1210		NO SAMPLE																									
1220		NO SAMPLE																									
1230		CLAY	2.5Y4/2		V. FIRM	MOIST	•																	•			L	IRON OXIDE
1240		•	•		•	•	•																	•			L	INCRU-
1250		•	•		•	•	•																	•			L	STATIONS
1260		NO SAMPLE																									
1270		NO SAMPLE																									
1280		NO SAMPLE																									
1290		NO SAMPLE																									
1300		CLAY	2.5Y4/2		V. FIRM	MOIST	•																			L	
1310		•	•		•	•	•																			L	
1320		•	•		•	•	•																			L	
1330		•	•		•	•	•																			L	
1340		•	•		•	•	•																			L	
1350		•	•		•	•	•																			L	
1360		•	•		•	•	•																			L	
1370		•	•		•	•	•																			L	
1380		•	•		•	•	•																			L	
1390		•	•		•	•	•																			L	
1400		•	•		•	•	•																			L	
1410		SILT &	2.5Y5/[illegible]		V. FIRM	MOIST		•																		L	
1420		CLAY LAMS.	•		•	•		•																		L	
1430		•	2.5Y4/[illegible]		•	•		•																		L	
1440		•	•		•	•		•																		L	
1450		•	•		•	•		•																		L	
1460		•	•		•	•		•																		L	
1470		•	•		•	•		•																		L	
1480		•	•		•	•		•																		L	
1490		•	•		•	•		•																		L	
1500		•	•		•	•		•																		L	
1510		•	•		•	•		•																		L	

DEPOSITIONAL ENVIRONMENT: M = Marsh ML = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Miocene S = Spoil IK = Upland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SE=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=lithoclasts DT=distorted F=fractures IN=inclusions

PLATE A50

BORING NUMBER: G-4
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	LAMINATIONS L W C R	SF	ORGANICS D O FD W S	SECONDARY STRUCTURE BR LC DT F IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1520		SILT & CLAY LAMS.	[illegible]		[illegible]	[illegible]										
1530																
1540																
1550																
1560																
1570																
1580																
1590																
1600																
1610																
1620																
1630																
1640																
1650																
1660																
1670																
1680																
1690		SILT	[illegible]		V. FIRM	MOIST										
1700																
1710																
1720																
1730																
1740		SILT & CLAY LAMS.	[illegible]	[illegible]	V. FIRM	MOIST										
1750																
1760																
1770																
1780																
1790																
1800																
1810																
1820																
1830																
1840																
1850																
1860																
1870																
1880																
1890																
1900																
1910																
1920																
1930																
1940																
1950																
1960																
1970																
1980																
1990																
2000																
2010																
2020																

DEPOSITIONAL ENVIRONMENT: [illegible]
STRATIGRAPHY: [illegible]

BORING NUMBER 6.4
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS (M P L W C R)	SF	ORGANICS (B D FD W)	S	SECONDARY STRUCTURE (BP LC DI F IN)	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
2030		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]									
2040		CLAY LAMS.													
2050															
2060															
2070															
2080															
2090															
2100															
2110															
2120															
2130															
2140															
2150															
2160															
2170															
2180															
2190															
2200															
2210															
2220															
2230															
2240															
2250															
2260															
2270															
2280															
2290															
2300															
2310															
2320															
2330															
2340															
2350															
2360															
2370															
2380															
2390															
2400															
2410															
2420															
2430															
2440		[illegible]	[illegible]		[illegible]	[illegible]									
2450		SILT													
2460															
2470															
2480															
2490															
2500															
2510															
2520															

DEPOSITIONAL ENVIRONMENT: [illegible]
STRATIGRAPHY: [illegible]

PLATE A52

BORING NUMBER: F-4
QUADRANGLE: HOUMA
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	LAMINATIONS P	ORGANICS FD	SECONDARY STRUCTURE IN	DEPOSIT ENVIRON	REMARKS
2530	CLAY	[illegible]		V. FIRM	MOIST	*		*		IS	
2540	*	*		*	*	*		*		IS	
2550	*	*		*	*	*		*		IS	
2560	CLAY	[illegible]		V. FIRM	MOIST	*		*		IS	
2570	*	*		*	*	*		*		IS	
2580	*	*		*	*	*		*		IS	
2590	*	*		*	*	*		*		IS	
2600	*	*		*	*	*		*		IS	
2610	*	*		*	*	*		*		IS	
2620	NO SAMPLE										
2630	NO SAMPLE										
2640	NO SAMPLE										
2650	NO SAMPLE										
2660	NO SAMPLE										
2670	NO SAMPLE										
2680	NO SAMPLE										
2690	CLAY	10YR5/1		V. FIRM	MOIST	*		*	*	IS	SIDERITE
2700	*	*		*	*	*		*	*	IS	NODULES
2710	*	*		*	*	*		*	*	IS	
2720	*	*		*	*	*		*	*	IS	
2730	*	*		*	*	*		*	*	IS	
2740	*	*		*	*	*		*	*	IS	
2750	*	*		*	*	*		*	*	IS	
2760	*	*		*	*	*		*	*	IS	
2770	*	*		*	*	*		*	*	IS	
2780	*	*		*	*	*		*	*	IS	
2790	*	*		*	*	*		*	*	IS	
2800	*	*		*	*	*		*	*	IS	
2810	*	*		*	*	*		*	*	IS	
2820	*	*		*	*	*		*	*	IS	
2830	*	*		*	*	*		*	*	IS	
2840	*	*		*	*	*		*	*	IS	
2850	*	*		*	*	*		*	*	IS	
2860	*	*		*	*	*		*	*	IS	
2870	NO SAMPLE										
2880	NO SAMPLE										
2890	NO SAMPLE										
2900	NO SAMPLE										
2910	NO SAMPLE										
2920	NO SAMPLE										
2930	CLAY	[illegible]YR5/1		V. FIRM	MOIST	*		*	*	IS	
2940	*	*		*	*	*		*	*	IS	
2950	SILT W/	[illegible]	[illegible]	V. FIRM	MOIST	*				[illegible]	
2960	CLAY LENS.	*	*	*	*		*			[illegible]	
2970	*	*	*	*	*		*			[illegible]	
2980	*	*	*	*	*		*			[illegible]	
2990	*	*	*	*	*		*			[illegible]	
3000	*	*	*	*	*		*			[illegible]	
3010	*	*	*	*	*		*			L	
3020	*	*	*	*	*		*			L	
3030	*	*	*	*	*		*			L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum

STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A53

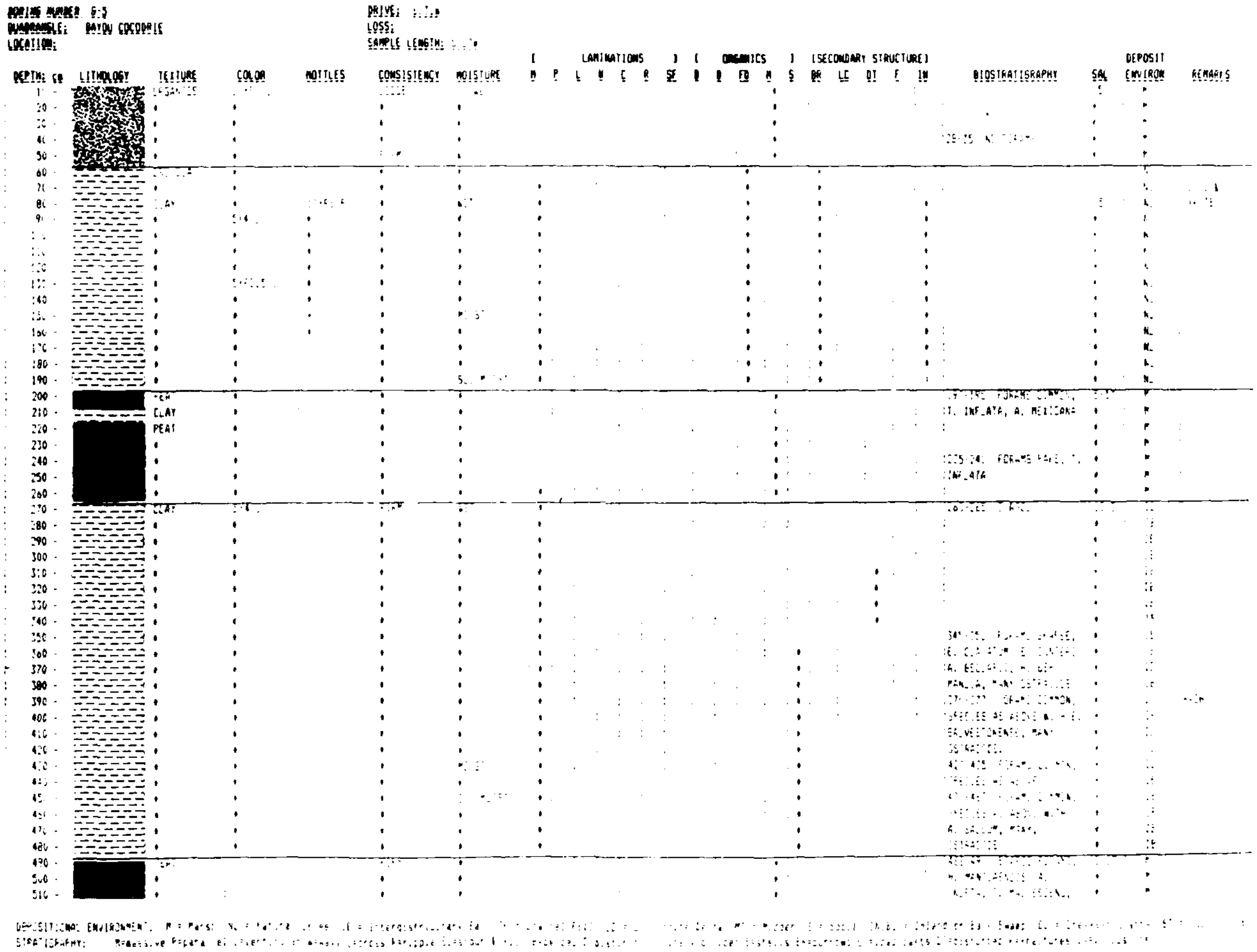

BORING NUMBER
QUADRANGLE: BAYOU COCODRIE
LOCATION:
DRIVE:
LOSS:
SAMPLE LENGTH:
DEPTH: cm
LITHOLOGY
TEXTURE
COLOR
MOTTLES
CONSISTENCY
MOISTURE
LAMINATIONS
ORGANICS
SECONDARY STRUCTURE
BIOSTRATIGRAPHY
SAL
DEPOSIT ENVIRON
REMARKS
CLAY
PEAT
INFLATA, A. MEXICANA
INFLATA
DEPOSITIONAL ENVIRONMENT:
STRATIGRAPHY:

PLATE A54

BORING NUMBER: 6-5
QUADRANGLE: BAYOU COCODRIE
LOCATION:

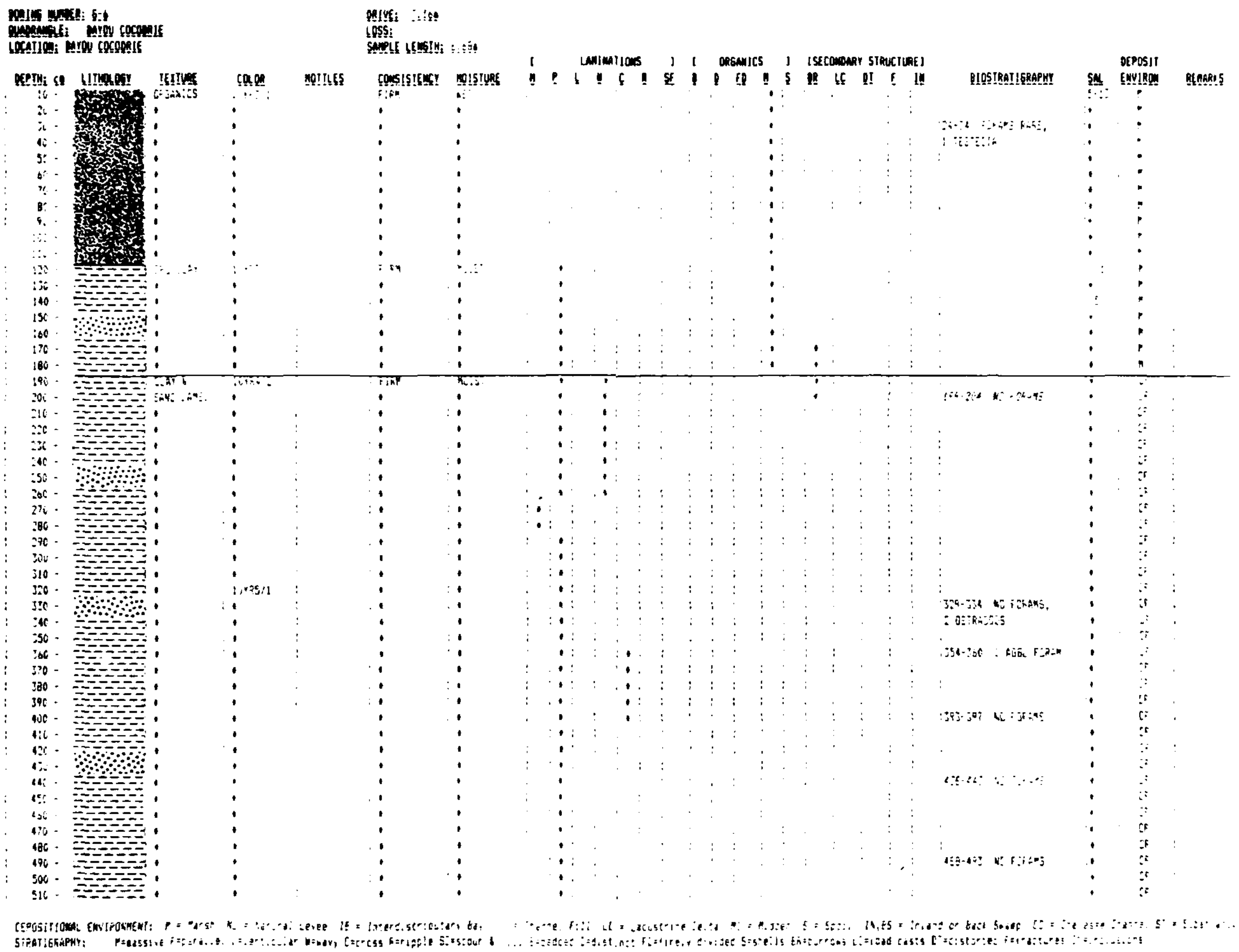
DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SF	B	D	FD	W	S	BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
							[	LAMINATIONS				]		[	ORGANICS		]	[SECONDARY	STRUCTURE]								
[illegible]		[illegible]			[illegible]	[illegible]											*	*						[illegible]	[illegible]	*	
53[illegible]		*			*	*											*								*	*	

[illegible]

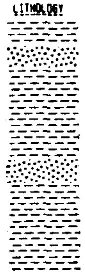
PLATE A55

PLATE A56


BORING NUMBER: 6-6
QUADRANGLE: BAYOU COCODRIE
LOCATION: BAYOU COCODRIE
DRIVE:
LOSS:
SAMPLE LENGTH:
DEPTH; CM
LITHOLOGY
TEXTURE
ORGANICS
CLAY &
SAND LAMS.
COLOR
MOTTLES
CONSISTENCY
FIRM
MOISTURE
LAMINATIONS
ORGANICS
SECONDARY STRUCTURE
BIOSTRATIGRAPHY
SAL
DEPOSIT
ENVIRON
REMARKS
DEPOSITIONAL ENVIRONMENT:
STRATIGRAPHY:

BORING NUMBER: 6-4
QUADRANGLE: BAYOU COCODRIE
LOCATION: BAYOU COCODRIE

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]



DEPTH: CM	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(M	P	LAMINATIONS L	W	C	R	SE)	(B	ORGANICS D	FD	M	S)	[SECONDARY BR	LC	DT	F	STRUCTURE] IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
[illegible]	CLAY &	[illegible]		FIRM	MOIST		•																			
[illegible]	SAND LAMS.	•		•	•		•																	•	[illegible]	
[illegible]	•	•		•	•		•																	•	[illegible]	
[illegible]	•	•		•	•		•																	•	[illegible]	
[illegible]	•	•		•	•		•																	•	[illegible]	
570	•	•		•	•		•																	•	[illegible]	
580	•	•		•	•		•																	•	[illegible]	
590	•	•		•	•		•																	•	[illegible]	
[illegible]	•	•		•	•		•																555-590 NO FORAMS,	•	[illegible]	
[illegible]	•	•		•	•		•																[illegible] OSTRACODS	•	[illegible]	
[illegible]	•	•		•	•		•																	•	[illegible]	
[illegible]	•	•		•	•		•																	•	[illegible]	
640	•	•		•	•		•																	•	[illegible]	
650	•	•		•	•		•																[illegible]-640 NO FORAMS	•	[illegible]	
660	•	•		•	•		•																	•	[illegible]	
666	•	•		•	•		•																	•	[illegible]	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MD = Midden S = Soil [illegible] = Inland or Back Swamp CS = Crevasse [illegible] ST = [illegible]
STRATIGRAPHY: M=Massive P=Parallel L=Lenticular W=Wavy C=Cross R=Ripple SE=Scour & Fill B=Bedded D=Distinct FD=Finely Divided S=Shells BR=Burrows LC=Root Casts DT=Distorted F=Fractures IN=[illegible]

PLATE A57

BORING NUMBER: 6-6A
QUADRANGLE: BAYOU COCODRIE
LOCATION: LAKE HACKBERRY

DRIVE: 6.73m
LOSS:
SAMPLE LENGTH: 6.45m

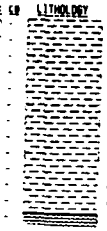
DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SF	ORGANICS D	B	FD	H	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10 -		ORGANICS	10YR2/1		LOOSE	V. WET											•									M	
20 -		& CLAY	•		•	•											•									M	
30 -		•	•		•	•											•									M	
40 -		•	•		•	•											•									M	
50 -		•	•		•	•											•									M	
60 -		•	•		•	•											•									M	
70 -		•	•		•	•											•									M	
80 -		•	•		•	•											•									M	
90 -		•	•		•	•											•									M	
100 -		•	•		•	•											•									M	
110 -		•	•		•	•											•									M	
120 -		•	•		•	•											•									M	
130 -		•	•		•	•											•									M	
140 -		•	•		•	•											•									M	
150 -		•	•		•	•											•									M	
160 -		ORGANIC	2.5Y3/2		FIRM	V. WET	•								•				•							NL	
170 -		CLAY	•		•	•	•								•				•							NL	
180 -		•	•		•	•	•								•				•							NL	
190 -		•	•	5Y4/2	•	•	•								•				•							NL	
200 -		•	•	•	•	•	•								•				•							NL	
210 -		•	•		•	•	•								•				•							NL	
220 -		•	5Y3/1		•	•	•								•				•							NL	
230 -		•	•		•	•	•								•				•							NL	
240 -		•	•		•	•	•								•				•							NL	
250 -		•	•		•	•	•								•				•							NL	
260 -		•	•		•	•	•								•				•							NL	
270 -		•	•		•	•	•								•				•							NL	
280 -		•	•		•	•	•								•				•							NL	
290 -		•	5Y2.5/1		•	•	•								•				•							NL	
300 -		•	•		•	•	•								•				•							NL	
310 -		•	•		•	•	•								•				•							NL	
320 -		•	5Y3/2		•	•	•								•				•							NL	
330 -		•	•		•	•	•								•				•							NL	
340 -		•	•		•	•	•								•				•							NL	
350 -		•	•		•	•	•								•				•							NL	
360 -		•	•		•	•	•								•											M	
370 -		SILT	5Y[illegible]/1		•	•	•								•											M	
380 -		CLAY	5Y2.5/1		•	•	•								•											M	
390 -		•	•		•	•	•								•											M	
400 -		•	•		•	•	•								•											M	
410 -		•	•		•	•	•								•											M	
420 -		•	•		•	•	•								•											M	
430 -		•	•		•	•	•								•											M	
440 -		PEAT			•	•	•								•											M	
450 -		•			•	•	•								•											M	
460 -		CLAY	5Y4/1		•	•	•								•											M	
470 -		•	•		•	•	•								•											M	
480 -		CLAY	5Y4/2		FIRM	V. WET	•	•										•								IB	LESS THAN 2%
490 -		•	•		•	•	•											•								IB	SILT LAMINAE
500 -		•	•		•	•	•											•								IB	INTERBEDDED
510 -		•	•		•	•	•											•								IB	IN CLAY.

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MD = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel SI = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripp. SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A58

BORING NUMBER: 6-6A
QUADRANGLE: BAYOU COCODRIE
LOCATION: LAKE HACKBERRY

DRIVE: 6.73m
LOSS:
SAMPLE LENGTH: 6.45m

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	[LAMINATIONS] M P L W C R SF	[ORGANICS] D B FD W	S	[SECONDARY STRUCTURE] BR LC BT F IB	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520		CLAY	[illegible]		FIRM	V. WET								
530														
540														
550														
560														
570														
580														
590														
600														
610														
620														
630														
640		SHELL												

DEPOSITIONAL ENVIRONMENT: [illegible]
STRATIGRAPHY: [illegible]

PLATE A59

BORING NUMBER: 6-7
QUADRANGLE: GIBSON
LOCATION: BAYOU B.LARGE

DRIVE:
LOSS:
SAMPLE LENGTH:

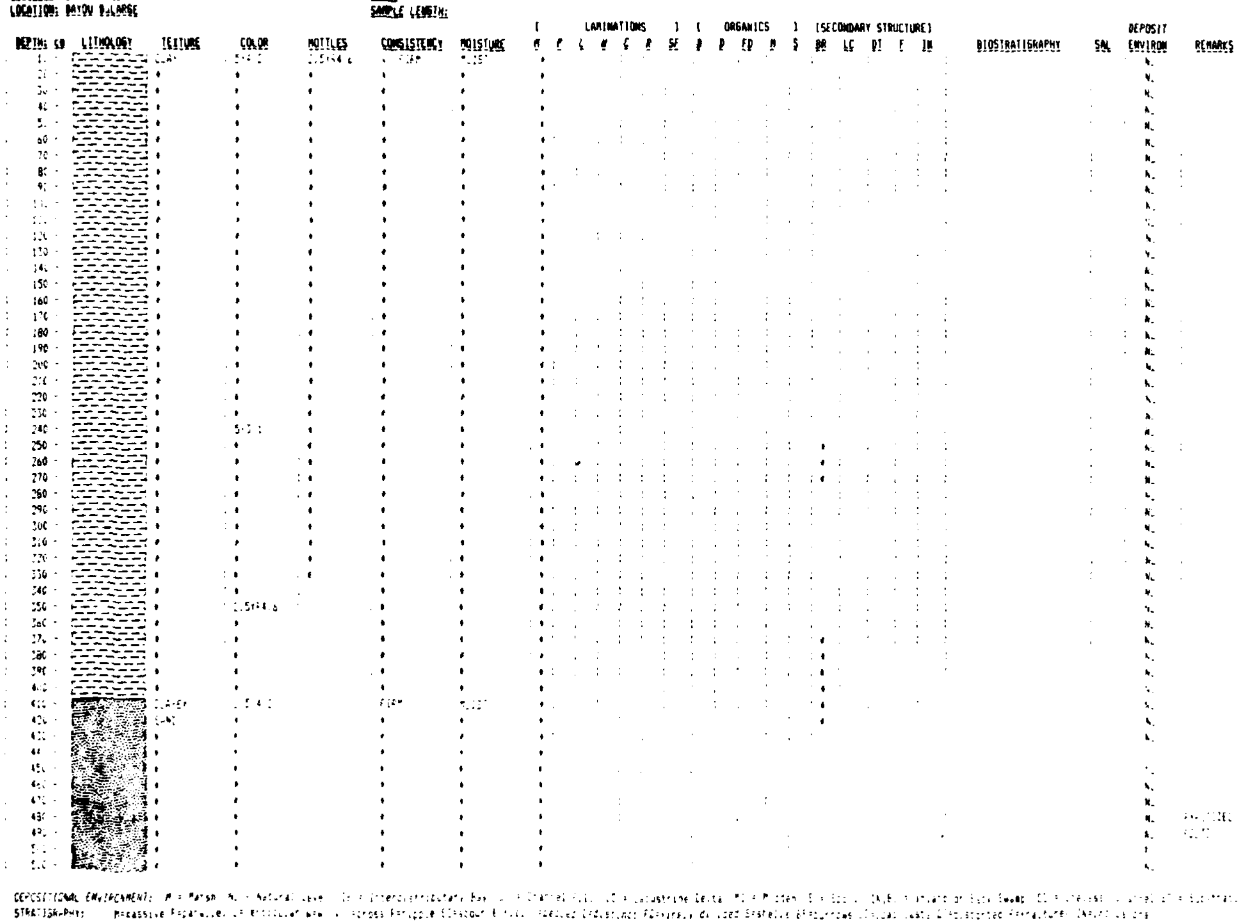


PLATE A60

BORING NUMBER: G-7
QUADRANGLE: GIBSON
LOCATION: BAYOU DuLARGE

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm | LITHOLOGY | TEXTURE | COLOR | MOTTLES | CONSISTENCY | MOISTURE | (LAMINATIONS) M P L W C R SE | (ORGANICS) B D FD W S | (SECONDARY STRUCTURE) BR LC OT F IN | BIOSTRATIGRAPHY | SAL | DEPOSIT ENVIRON | REMARKS

520 - CLAYEY SAND; FIRM; MOIST; NL
530 - 540 - 550 - 560 - 570 - 580 - 590 - 600 -
588-591 NC FORAMS
599-637 NC HOLOCENE
FORAMS. RELICT FORAMS
610 - 620 - 630 - 640 - 650 - 660 - 670 - 680 - 690 - 700 - 710 - 720 - 730 - 740 - 750 - 760 - 770 - 780 - 790 - 800 - 810 - 820 - 830 - 840 - 850 - 860 - 870 - 880 - 890 - 900 - 910 -
900-937 NC HOLOCENE
FORAMS. RELICT FORAMS
920 - 930 - 940 - 950 - 960 - 970 - 980 - 990 - 1000 - 1010 - 1020 -

DEPOSITIONAL ENVIRONMENTS: M = Marsh NL = Natural Levee IB = Interdistributary Bay [illegible]
STRATIGRAPHY: [illegible]

PLATE A61

BORING NUMBER: G-7
QUADRANGLE: GIBSON
LOCATION: BAYOU DULARGE

DRIVE: 5.2M
LOSS:
SAMPLE LENGTH:

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1030	CLAYEY	2.5 4 2		FIRM	MOIST				
1035	SAND	•		•	•				
1040	FINE SANDY	2.5 4 2		FIRM	MOIST				
1050	CLAY LAMS.	•		•	•				
1060	•	•		•	•				
1070	•	•		•	•				
1080	•	•		•	•			L	
1090	•	•		•	•				
1100	•	•		•	•				
1110	•	•		•	•				
1120	•	•		•	•				
1130	•	•		•	•				
1140	•	•		•	•				
1150	•	•		•	•				
1160	•	•		•	•			L	
1170	•	•		•	•			L	
1180	•	•		•	•			L	
1190	•	•		•	•			L	
1200	•	•		•	•			L	
1210	•	•		•	•	1205-1298 NO FORAMS		L	
1220	•	•		•	•			L	
1230	•	•		•	•			L	
1240	•	•		•	•			L	
1250	•	•		•	•			L	
1260	•	•		•	•			L	
1270	•	•		•	•			L	
1280	•	•		•	•			L	
1290	•	•		•	•			L	
1300	•	•		•	•			L	
1310	•	•		•	•			L	
1320	•	•		•	•			L	
1330	•	•		•	•			L	
1340	•	•		•	•			L	
1350	•	•		•	•			L	
1360	•	•		•	•			L	
1370	•	•		•	•			L	
1380	•	•		•	•			L	
1390	•	•		•	•			L	
1400	•	•		•	•			L	
1410	•	•		•	•			L	MOTTLES
1420	•	•		•	•			L	•
1430	•	•		•	•			L	•
1440	•	•		•	•			L	•
1450	•	•		•	•			L	•
1460	•	•		•	•			L	•
1470	•	•		•	•			L	
1480	•	•		•	•			L	
1490	•	•		•	•			L	
1500	•	•		•	•			L	MOTTLES
1510	•	•		•	•	1151-1515 NO HOLOCENE		L	•
1520	•	•		•	•	FORAMS, 1E RELICT FORAMS		L	•

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IE = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum

STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SE=scour & fill B=bedded D=distinct FD=finely divided S=shells B=burrows LC=load casts DT=distorted F=fractures IN=intrusions

PLATE A62

BORING NUMBER: 6-7
QUADRANGLE: GIBSON
LOCATION: BAYOU DuLARGE

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH:

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
[illegible]	FINE SANDS	[illegible]		FIRM	MOIST	[illegible] NO FORAMS		L	
1540	CLAY LAMS	•		•	•			L	
1550	•	•		•	•			L	
1560	•	•		•	•			L	
1570	•	•		•	•			L	
1580	•	•		•	•			L	
1590	•	•		•	•			L	
1600	•	•		•	•			L	
1610	•	•		•	•			L	
1620	•	•		•	•			L	
1630	•	•		•	•			L	
1640	•	•		•	•			L	
1645	•	•		•	•			L	
1650	NO SAMPLE								
1660	NO SAMPLE								
1670	NO SAMPLE								
1680	NO SAMPLE								
1690	NO SAMPLE								
1700	NO SAMPLE								
1710	NO SAMPLE								
1720	FINE SAND	[illegible]		FIRM	MOIST			L	
1730	•	•		•	•			L	
1740	•	•		•	•			L	
1750	•	•		•	•			L	
1760	•	•		•	•			L	
1770	•	•		•	•			L	
1780	•	•		•	•			L	
1790	•	•		•	•			L	
1800	•	•		•	•			L	
1810	•	•		•	•			L	
1820	•	•		•	•			L	
1830	•	•		•	•	1827-1833 NO FORAMS		L	
1840	•	•		•	•			L	
1850	•	•		•	•			L	
1860	•	•		•	•			L	
1870	•	•		•	•			L	
1880	•	•		•	•			L	
1890	•	•		•	•			L	
1900	•	•		•	•			L	
1910	•	•		•	•	1908-1915 MANY RELICT FORAMS		L	
1920	•	•		•	•			L	
1930	•	•		•	•			L	
1940	•	•		•	•			L	
1950	•	•		•	•			L	
1960	•	•		•	•			L	
1970	•	•		•	•			L	
1980	•	•		•	•			L	
1990	•	•		•	•			L	
2000	•	•		•	•			L	
2010	•	•		•	•			L	
2020	•	•		•	•			L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MD = Mudflat [illegible]
STRATIGRAPHY: [illegible]

BORING NUMBER: G-7
QUADRANGLE: GIBSON
LOCATION: BAYOU DULARGE

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH:

DEPTH	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
2030		FINE SAND	TAN		FIRM	MOIST				
2210							2200-2205 SPARSE FORAMS			
2260		SILT &	GRAY		V. FIRM	MOIST				
2270		CLAY LAMS.								
2350										NODULES
2400							2392-2395 ? RELICT			
2410							FORAMS, NO MOLLUSKS			

DEPOSITIONAL ENVIRONMENTS: M = Marsh, NL = Natural Levee, IE = Interdistributary [illegible]

STRATIGRAPHY: [illegible]

PLATE A64

BORING NUMBER: 6-7
QUADRANGLE: GIBSON
LOCATION: BAYOU DuLARGE

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH:

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
2530	SILT &	5Y4/2		FIRM	MOIST			L	
2540	•	•		•	•			L	
2550	•	•		•	•			L	
2560	CLAY	5Y4/2		V. FIRM	MOIST			L	
2570	•	•		•	•			L	
2580	•	•		•	•			L	
2590	•	•		•	•			L	
2600	•	•		•	•			L	
2610	•	•		•	•			L	
2620	•	•		•	•			L	
2630	•	•		•	•			L	
2640	•	•		•	•			L	
2650	•	•		•	•			L	
2660	•	•		•	•			L	
2670	•	•		•	•			L	
2680	•	•		•	•			L	
2690	•	•		•	•			L	
2700	COARSE SND	2.5Y6/2		LOOSE	DRY			CC	
2710	CLAY	5Y4/2		V. FIRM	MOIST	2703-2707 NO FORAMS		CC	
2720	•	•		•	•			CC	
2730	COARSE SND	2.5Y5/2		LOOSE	DRY			CC	
2740	CLAY	5Y4/2		V. FIRM	MOIST			CC	
2750	•	•		•	•			CC	
2760	•	•		•	•			CC	
2770	•	•		•	•			CC	
2780	•	•		•	•			CC	
2790	COARSE SND	2.5Y5/2		LOOSE	DRY			CC	
2800	•	•		•	•			CC	
2810	•	•		•	•			CC	
2820	•	•		•	•			CC	
2830	•	•		•	•			CC	
2840	•	•		•	•			CC	
2850	•	•		•	•			CC	
2860	•	•		•	•			CC	
2870	•	•		•	•			CC	
2880	•	•		•	•			CC	
2885	•	•		•	•			CC	
2890	CLAY	5Y4/2		V. FIRM	MOIST			CC	
2900	•	•		•	•			CC	
2905	•	•		•	•			CC	
2910	COARSE SND	2.5Y5/2		LOOSE	DRY	2910-2915 NO FORAMS		CC	
2920	•	•		•	•			CC	
2930	•	•		•	•			CC	
2940	•	•		•	•			CC	
2950	•	•		•	•			CC	[illegible]
2960	•	•		•	•			CC	
2970	•	•		•	•			CC	
2980	•	•		•	•			CC	
2990	•	•		•	•	2987-2990 2 RELICT		CC	
3000	•	•		•	•	FORAMS, NO MODERN		CC	
3010	•	•		•	•			CC	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substrate
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

BORING NUMBER: G-7
QUADRANGLE: GIBSON
LOCATION: BAYOU DuLARGE

DRIVE: 5.30m
LOSS:
SAMPLE LENGTH:

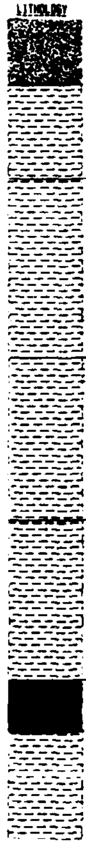
DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SF	ORGANICS D	D	FD	W	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
[illegible]		COARSE SAND	[illegible]		LOOSE	[illegible]																				[illegible]	
[illegible]																										[illegible]	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MD = Midden S = Soil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substra[illegible]
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A66

BORING NUMBER: LB-1
QUADRANGLE: LOST LAKE
LOCATION: RICE BAYOU

DRIVE: 6.32m
LOSS:
SAMPLE LENGTH: 5.11m



DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	R	S	BR	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	ORGANICS	5Y2.5/1		FIRM	WET	•		•		0-5 FORAMS COMMON, T.	12-30	M	
20	•	•		•	•	•		•		MACRESCENS, A SALSUM	•	M	
30	•	•		•	•	•		•		M. FUSCA	•	M	
40	•	•		•	•	•		•			•	M	
50	CLAY	10YR5/1		FIRM	WET	•				45-50 FORAMS COMMON, TRO-	•	M	
60	•	•		•	•	•				CHAMMINA SP, A. MEXICANNA,	•	M	
70	•	•		•	•	•				A. SALSUM, M. FUSCA, I	•	M	
80	•	•		•	•	•	•			TESTECIA	•	M	
90	•	•		•	•	•	•				•	M	
100	•	•		•	•	•	•				•	M	
110	CLAY	10YR5/1		FIRM	WET	•					12-30	IB	
120	•	•		•	•	•					•	IB	
130	•	•		•	•	•				130-136 T. MACRESCENS, A.	•	IB	
140	•	•		•	•	•				MEXICANUM, A. SALSUM	•	IB	
150	•	•		•	•	•				A. BECCARII, A FEW	•	IB	
160	•	•		•	•	•				OSTRACODS	•	IB	
170	•	•		•	•	•					•	IB	
180	•	•		•	•	•					•	IB	
190	•	•		•	•	•					•	IB	
200	•	•		•	•	•					•	IB	
210	•	•		•	•	•				206-211 ALL RARE AGGL	•	IB	
220	•	•		•	•	•	•			FORAMS	•	M	
230	•	•		•	•	•	•				•	M	
240	•	•		•	•	•	•				•	M	
250	•	•		•	•	•	•				•	M	
260	•	•		•	•	•		•			•	M	
270	•	•		•	•	•		•			•	M	
280	•	•		•	•	•		•			•	M	
290	•	•		•	•	•		•			•	M	
300	•	•		•	•	•		•			•	M	
310	•	•		•	•	•		•			•	M	
320	•	•		•	•	•					•	IB	
330	•	•		•	•	•				330-336 SPARSE FORAMS, T.	•	IB	
340	•	•		•	•	•				MACRESCENS, A. MEXICANUM	•	IB	
350	•	•		•	•	•					•	IB	
360	•	•		•	•	•			•	361-366 FORAMS COMMON	•	IB	
370	•	•		•	•	•			•	APROX 3/4 ARE H. GERMANICA	•	IB	
380	•	•		•	•	•				ALSO A. BECCARII, E.	•	IB	
390	•	•		•	•	•				CLAVATUM, MUSSEL SHELL	•	IB	
400	•	•		•	•	•				FRAGMENTS	•	IB	
410	•	•		•	•	•		•				IB	
420	PEAT			FIRM	WET			•		405-411 FORAMS COMMON, H.	12-30	M	
430	•			•	•			•		GERMANICA, A. BECCARII,	•	M	
440	•			•	•			•		T. INFLATA, T. MACRESCENS	•	M	
450	CLAY	10YR6/1		V. FIRM	MOIST	•				H. MEXICANA	[illegible]	M	
460	•	•		•	•	•				436-442 FORAMS COMMON, H.	•	M	
470	•	•		•	•	•				GERMANICA, A. BECCARII	•	M	PYRITIZED
480	•	•		•	•	•				T. MACRESCENS, M. WILBERT	•	M	ROOTS
490	•	•		•	•	•				A. MEXICANA	•	M	
500	•	•		•	•	•				500-506 1 A. MEXICANA	•	M	
510	•	•		•	•	•					•	M	

DEPOSITIONAL ENVIRONMENT: M = Marsh ML = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel SS = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A67

BORING NUMBER: LD-2
QUADRANGLE: LOST LAKE
LOCATION: CARRION CROW

DRIVE: 6.10M
LOSS:
SAMPLE LENGTH: 3.45M

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SC	ORGANICS B	D	FD	W	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10																											
20		CLAY	10YR3/3	7.5YR4/4	FIRM	MOIST	•							•					•					25-30 forams common T.	5-13	NL	OXIDIZED
30							•							•					•					macrescens,T. salsa		NL	
40							•							•					•					A. inepta, M. wilberty		NL	
50		ORG CLAY	5Y2.5/1		FIRM	MOIST	•							•					•							NL	
60							•							•					•				•			NL	PYRITI ROOTS
70							•							•					•				•			NL	•
80							•							•					•				•			NL	•
90							•							•					•				•			NL	•
100					FIRM		•							•					•				•			NL	•
110							•							•					•				•			NL	•
120							•												•				•			NL	•
130							•												•				•			NL	•
140		PEAT	2.5Y2/0		FIRM	MOIST		•									•						•	132-135 sparse forams,all		M	•
150								•									•							M. wilberti		M	•
160								•									•									M	•
170								•									•									M	•
180		ORG CLAY	2.5Y2/0		FIRM	MOIST		•									•		•					150-160 forams common T.		M	•
190								•									•		•					macrescens,T. inflata,M.		M	•
200		CLAY	5Y4/1		FIRM	WET		•											•					manilaensis,A. inepta		M	•
210								•											•						<5	M	•
220							•																			M	•
230							•									•							•	225-230 no forams,sparse		M	•
240							•									•							•	diatoms		M	•
250							•									•							•			M	•
260							•									•							•			M	•
270							•									•							•			M	•
280							•									•							•	275-280 no forams,sparse		M	•
290		CLAY	5Y4/1		FIRM	WET	•									•		•						diatoms		ID	
300							•									•		•								ID	
310							•									•		•								ID	
320							•									•		•								ID	
330							•									•		•								ID	
340							•									•		•								ID	
350							•									•		•								ID	
360								•		•								•						345-350 forams common, A.		ID	
370								•		•								•						beccarii,N. germanka,E.		ID	
380								•		•								•						clavatum,E.galvestonese,		ID	
390								•		•								•						ostracods common		ID	
400								•		•								•								ID	
410								•		•								•							13-30	ID	
420								•		•								•								ID	
430								•		•								•								ID	
440								•		•								•								ID	
450					FIRM	WET		•		•								•								ID	
460								•		•								•								ID	
470								•		•								•								ID	
480								•		•								•								ID	
490								•		•								•								ID	
500					FIRM	VERY MOIST		•		•								•						490-495 forams common,A.	13-30	ID	
510								•		•								•						beccarii,N.germanica,E.		ID	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee ID = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN.BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: LP-2
QUADRANGLE: LOST LAKE
LOCATION: CARRION CROW

DRIVE: 6.48M
LOSS:
SAMPLE LENGTH: 5.45M

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SC	ORGANICS B	D	FD	R	S	(SECONDARY STRUCTURE) BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520 -		CLAY	5Y4/1		FIRM	WET	*									*		*						kugleri	13-30	IS	
530 -								*		*								*						540-545 sparse forams,A.		IS	
540 -								*		*								*						becarii,N.germanica,E.		IS	
550 -								*		*								*						E.gkunteri,E.kugleri,many		IS	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel S' = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

BORING NUMBER: LB-3
QUADRANGLE: CARENCRO BAYOU
LOCATION: CARRION CROW

DRIVE: 6.30m
LOSS: 1.10m
SAMPLE LENGTH: 5.20m

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARK
10	ORG CLAY	10YR3/1		FIRM TO	MOIST	0-5 FORAMS ABUNDANT	5-13	S	
20	•	•		V. FIRM	•	T. IRREGULARIS	•	S	
30	•	•		•	•	T.MACRESCENS,A.INEPTA,	•	S	
40	•	•		•	•	A.MEXICANA ,M.FUSCA	•	S	
50	•	•		•	•		•	S	
60	•	•		•	•		•	S	
70	•	•		•	•		•	S	
80	•	•		•	•		•	S	
90	•	•		•	•		•	S	
100	•	•		•	•		•	S	
110	•	•		•	•		•	S	
120	•	•		•	•		•	S	
130	•	•		•	•		•	S	
140	•	•		•	•		•	S	
150	CLAY	5Y2.5/2		FIRM TO	MOIST	140-145 FORAMS COMMON,	5-13	ID	
160	•	•		V. FIRM	•	M. FUSCA,A.SALSUM AND	•	ID	
170	•	•		•	•	AMMOBACULITES SP.T.	•	ID	
180	•	•		•	•	IRREGULARIS	•	ID	
190	•	•		•	•		•	ID	
200	•	•		•	•		•	ID	
210	SHELL HASH	•		•	•		•	ID	
220	•	•		•	•		•	ID	
230	CLAY	2.5Y3/2		FIRM TO	MOIST	225-230 SPARSE FORAMS	5-13	ID	
240	•	•		V. FIRM	•	ALL A. SALSUM,SPARSE	•	ID	
250	•	•		•	•	OSTRACODS	•	ID	
260	•	•		•	•		•	ID	
270	•	•		•	•		•	ID	
280	•	•		•	•		•	ID	
290	•	•		•	•	288-291 FORAMS COMMON ALL	•	ID	
300	•	•		•	•	A.SALSUM & A.BECCARII,	•	ID	
310	ORG CLAY	2.5Y2/0	4.5Y5/4	V. FIRM	MOIST	P-ANGIA	5-13	M	FIBR...
320	CLAY	•	•	•	•	300-307 NO FORAMS	•	M	ROOTS
330	•	5Y5/1	•	•	•	14-320 FORAMS RARE	•	M	•
340	•	•	•	•	•	MOST A. BECCARII,SPARSE	•	M	•
350	•	•	•	•	•	OSTRACODS	•	M	•
360	•	•	•	•	•		•	M	•
370	•	•	•	•	•		•	M	•
380	•	•	•	•	•		•	M	•
390	•	•	•	•	•		•	M	•
400	PEAT			V. FIRM	MOIST		•	M	•
410	•			•	•		•	M	•
420	CLAY	5Y4/1		V. FIRM	MOIST	400-405 FORAMS COMMON,	5	M	•
430	(SILTY)	•		•	•	MOST BROKEN A. INEPTA	•	M	•
440	•	•		•	•		•	M	•
450	•	•		•	•		•	M	•
460	•	•		•	•		•	M	•
470	•	•		•	•		•	M	
480	•	•		•	•		•	M	
490	•	•		•	•		•	M	
500	•	•		•	•		•	M	
510	•	•		•	•	50-505 NO FORAMS	•	C	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee ID = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST ...
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BU=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A70

BORING NUMBER: LB-3
QUADRANGLE: CARENCRO BAYOU
LOCATION: CARRION CROW

DRIVE: 6.50m
LOSS: 1.72m
SAMPLE LENGTH: 6.80m

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SE	ORGANICS D	P	FD	W	S	SECONDARY STRUCTURE BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520	CLAY	5Y4/1		V. FIRM	MOIST		•		•															•	C	
530	•	•		•	•		•		•															•	C	
540	•	•		•	•		•		•															•	C	
550	•	•		•	•		•		•															•	C	
560	•	•		•	•		•		•															•	C	
570	•	•		•	•		•		•															•	C	
580	•	•		•	•		•		•															•	C	
590	•	5Y5/2		•	•		•		•															•	C	
600	•	•		•	•		•		•															•	C	
610	SILT &	•		•	•		•		•															•	C	
620	SAND	•		SLIGHTLY	MOIST		•		•														580-585 NO FORAMS	•	C	
630	LAMINATION	•		•	•		•		•															•	C	
640	•	•		•	•		•		•															•	C	
650	•	•		•	•		•		•															•	C	
660	•	•		•	•		•		•														649-654 NO FORAMS	•	C	
				•	•		•		•														649-654 NO FORAMS	•	C	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel, ST = Substr
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple S. scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts D=distorted F=fractures IN=inclusions

BORING NUMBER: LB-4
QUADRANGLE: CARENCRO BAYOU
LOCATION: BAYOU CARRION CROW

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	CLAY	[illegible]		FIRM	MOIST	[illegible] FORAMS RARE, H. MANILAENSIS	[illegible]	M	
40		5Y[illegible]						M	
70	ROOTS	5Y[illegible]		LOOSE	WET			M	
80	CLAY	5Y[illegible]		FIRM	MOIST			M	
170	ROOTS	5Y[illegible]		LOOSE	WET		[illegible]	M	
180	CLAY	5Y[illegible]		FIRM	MOIST		[illegible]	M	
200	SILT	5Y4/1		FIRM	MOIST	192-197 NO FORAMS, RARE OSTRACODS	[illegible]	M	
220	CLAY	5Y[illegible]		FIRM	MOIST	228-233 NO FORAMS		IB	
320						317-318 FORAMS COMMON, MOST ARE A. SALSUM		IB	
340	SILTY CLAY	5Y4/1		FIRM	MOIST		[illegible]	IB	
350					WET			IB	
370						358-363 SPARSE FORAMS, H. MANILAENSIS, T. MACRESCENS		IB	
430						428-433 FORAMS COMMON, A. SCCIARII, [illegible]		IB	
440	CLAY	[illegible]		FIRM	WET	[illegible]	[illegible]	IB	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta [illegible] Spoil [illegible] = Upland or Back Swamp CC = Crevasse [illegible]

STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple S=scour & fill [illegible] ED=distinct FD=finely divided S=shell [illegible] BR=burrows LC=lead casts DT=distorted F=fractures IN=inclusion

PLATE A72

BORING NUMBER: LD-4
QUADRANGLE: CARENCRO BAYOU
LOCATION: BAYOU CARRION CROW

DRIVE: [illegible].28m
LOSS:
SAMPLE LENGTH: [illegible].28m

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SF	ORGANICS B	D	FD	W	S	SECONDARY STRUCTURE BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520 -		SILTY CLAY	5Y4/1		FIRM	WET		•										•							17-3[illegible]	IB	
530 -		•	•		•	•		•										•							•	IB	
540 -		•	•		•	•		•										•							•	IB	
550 -		•	•		•	•		•										•							•	IB	
560 -		•	•		•	•		•										•							•	IB	
570 -		•	•		V. FIRM	MOIST		•										•							•	IB	
580 -		•	•		•	•		•										•							•	IB	
590 -		•	•		•	•		•										•							•	IB	
600 -		•	•		•	•		•										•							•	IB	
610 -		•	•		•	•		•										•							•	IB	
620 -		•	•		•	•		•										•							•	IB	
630 -		•	•		•	•		•										•						528-643 FORAMS ABUNDANT,	•	IB	
640 -		•	•		•	•		•										•						SPECIES AS IN 528-533,	•	IB	
650 -		•	•		V. FIRM	MOIST		•										•						1 OSTRACOD, MULINIA	•	IB	
660 -		•	•		•	•		•										•							•	IB	
670 -		•	•		•	•		•										•						673-676 FORAMS COMMON,	•	IB	
680 -		•	•		•	•		•										•						SPECIES AS IN 528-533	•	IB	
690 -		•	•		•	•		•										•						PLUS A. SALSUM, OSTRA-	•	IB	
700 -		•	•		•	•		•										•						CODS, MULINIA	•	IB	
710 -		•	•		•	•		•										•						723-728 ABUNDANT FORAMS,	•	IB	
720 -		•	•		•	•		•										•						SPECIES AS IN 528-533,	•	IB	
728 -		•	•		•	•		•										•						MULINIA	•	IB	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IS,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

BORING NUMBER: LB-6
QUADRANGLE: PLUMB BAYOU
LOCATION: PLUMB BAYOU

DRIVE: 6.62m
LOGS:
SAMPLE LENGTH: 6.07m

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SE	B	D	FD	W	S	BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		CLAY	10YR3/2		V. FIRM	MOIST	•										•							0-5 FORAMS SPARSE,	5-12	M	
20		•	•		•	•	•										•							T. IRREGULARIS, T.	•	P	
30		•	5Y2.5/2		•	WET	•										•							INFLATA	•	M	
40		•	•		FIRM	•	•										•								•	M	
50		•	•		•	•	•										•								•	P	
60		•	•		•	•	•										•								•	M	
70		•	2.5Y2/0		•	•	•										•								•	M	
80		•	•		•	•	•										•							70-75 1 H. MANILAENSIS	•	M	
90		•	•		•	•	•										•								•	M	
100		•	•		•	•	•										•								•	P	
110		•	•		•	•	•										•								•	P	
120		•	•		•	•	•										•								•	P	
130		•	•		•	•	•										•								•	P	
140		•	5Y4/1		•	•	•										•								•	P	
150		•	•		•	•	•											•							•	?	
160		•	•		•	•	•											•						150-155 FORAMS SPARSE,	•	IB	
170		•	•		•	•	•											•						T. INFLATA, H. WILBERT,	•	IB	
180		•	•		•	•	•											•						A. INEPTA, R. FUSCA	•	IB	
190		•	•		•	•	•											•							•	IB	
200		SILT	5Y4/1		FIRM	WET	•	•										•							•	IB	
210		CLAY	5Y4/1		FIRM	WET	•	•										•							12-30	IB	
220		•	•		•	•	•	•										•							•	IB	
230		•	•		•	•	•	•										•							•	IB	
240		•	•		•	•	•	•										•						230-233 ABUNDANT FORAMS,	•	IB	
250		•	•		•	•	•	•										•						ALL E. CLAVATUM	•	IB	
260		•	•		•	•		•		•								•							•	IB	45% SILT
270		•	•		•	•		•		•								•							•	IB	LAMINATIONS
280		•	•		•	•		•		•								•						270-275 FORAMS COMMON,	•	IB	FROM 250-300
290		•	•		•	•		•		•								•						A. BECCARII, E. CLAVA-	•	IB	
300		•	•		•	•		•		•								•						TUM, H. GERMANICA	•	IB	
310		SILT	5Y4/1		FIRM	WET		•		•								•							•	IB	
320		•	•		•	•		•		•								•							•	IB	
330		CLAY	5Y4/1		FIRM	WET		•		•								•						320-325 FORAMS ABUNDANT,	12-30	IB	
340		•	•		•	•		•		•								•						A. BECCARII, E. GALVE-	•	IB	
350		•	•		•	•		•		•								•						STONENSE, E. GUNTERI,	•	IB	
360		•	•		•	•		•		•								•						H. GERMANICA	•	IB	
370		•	•		•	•		•		•								•						370-375 FORAMS ABUNDANT,	•	IB	
380		•	•		•	•		•		•								•						A. BECCARII, E. CLAVA-	•	IB	
390		•	•		•	•		•		•								•						TUM, E. KUGLERI, H.	•	IB	
400		•	•		•	•		•		•								•						GERMANICA	•	IB	
410		SILT	5Y4/1		V. FIRM	WET		•		•								•						400-405 FORAMS COMMON,	13-30	IB	
420		•	•		•	•		•		•								•						A. BECCARII, E. CLAVA-	•	IB	
430		•	•		•	•		•		•								•						TUM, H. GERMANICA	•	IB	
440		CLAY	5Y4/1		V. FIRM	WET		•		•								•							12-30	IB	
450		•	•		•	•		•		•								•							•	IB	
460		•	•		•	•		•		•								•							•	IB	
470		•	•		•	•		•		•								•							•	IB	
480		•	•		•	•		•		•								•						470-475 FORAMS ABUNDANT,	•	IB	
490		SILT	5Y4/1		FIRM	MOIST		•		•								•						A. BECCARII, E. CLAVA-	13-30	IB	
500		•	•		•	•		•		•								•						TUM, E. GUNTERI, E.	•	IB	
510		CLAY	5Y4/1		FIRM	MOIST		•		•								•						KUGLERI	13-30	IB	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Bac Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SE=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A74

BORING NUMBER: LP-6
QUADRANGLE: PLUMB BAYOU
LOCATION: PLUMB BAYOU

DRIVE: 6.07m
LOSS:
SAMPLE LENGTH: 6.07m

								LAMINATIONS							ORGANICS					SECONDARY STRUCTURE							DEPOSIT	
DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SF	B	I	FD	W	S	BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	ENVIRON	REMARKS
520 -		CLAY	5Y4/1		FIRM	MOIST		•		•								•							13-20	IS	
530 -		•	•		•	•		•		•								•							•	IS	
540 -		SILT	5Y4/1		FIRM	MOIST		•		•								•							13-30	IS	
550 -		CLAY	5Y4/1		FIRM	MOIST		•										•							13-20	IS	
560 -		•	•		•	•		•										•							•	IS	
570 -		•	•		•	•	•																	560-565 FORAMS SPARSE,	•	IS	
580 -		•	•		•	•	•																	A. BECCARII, E. CLAVA-	•	IS	
590 -		SILT	5Y4/1		FIRM	MOIST	•																	TUM, H. GERMANICA	13-30	IS	
600 -		•	•		•	•	•																		•	IS	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MF = Mudflat S = Spoil IN,ES = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded I=indistinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

BORING NUMBER: LB-7
QUADRANGLE: PLUMB BAYOU
LOCATION: PLUMB BAYOU

DRIVE: 5.10
LOSS:
SAMPLE LENGTH: 5.10

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		ORGANIC	10YR2/1		LOOSE	V. WET	0-45 FORAMS COMMON, T.			
20		WITH CLAY					IRREGULARIS, A. ME-			
30							XICANSIS, A. INEPTA			
40										
50			10YR2/1						P	
60									P	
70									P	
80			5Y2.5/1						P	
90									P	
100									P	
110							105-115 FORAMS COMMON,		P	
120				5Y4/1			T. IRREGULARIS, A.		P	
130							MEXICANA, A. INEPTA,		P	
140		PEAT			LOOSE	V. WET	M. FUSCA	5-10	P	
150			5Y4/1				140-145 FORAMS SPARSE,		P	
160		CLAY	5Y4/1		FIRM	V. WET	T. IRREGULARIS, A.	5-10		
170							MEXICANA, A. INEPTA,		M	
180							T. MACRESCENS		M	
190							160-167 NO FORAMS		M	SILT LAMINA
200									M	
210									M	
220									M	PYRITIZED
230							215-220 FORAMS RARE, A.		M	ROOTS
240							INEPTA, T. MACRESCANS		M	
250									M	
260							245-250 FORAMS COMMON,		P	
270							ALL A. BECCARII & H.		IB	
280							GERMANICA		IB	
290									IB	
300									IB	
310									IB	
320		SILTY CLAY	5Y4/1		FIRM	V. WET		5-10	IB	
330									IB	
340									IB	
350									IB	
360									IB	
370									IB	
380									IB	
390							375-380 ABUNDANT FORAMS,		IB	
400							A. BECCARII, E. CLAVA-		IB	
410							TUM, H. GERMANICA,		IB	
420					V. FIRM	WET	OSTRACODS, DIATOMS		IB	
430									IB	
440									IB	
450									IB	
460									IB	
470									IB	
480									IB	
490							470-475 ABUNDANT FORAMS,		IB	
500							A. BECCARII, E. CLAVA-		IB	
510							TUM, E. GUNTERI, E. KUG-		IB	
							LERI, H. GERMANICA,		IB	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN = Inland or Back Swamp CI = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=Massive P=Parallel L=Lenticular W=Wavy C=Cross R=Ripple SC=Scour & Fill B=Bedded D=Distinct FD=Finely Divided S=Shells BR=Burrows LC=Lithoclasts DI=Discolored F=Fractures IN=Inclusions

PLATE A76

BORING NUMBER: LB-7
QUADRANGLE: PLUMB BAYOU
LOCATION: PLUMB BAYOU

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
500	SILTY CLAY	5Y4/1		V. FIRM	WET	OSTRACODS	[illegible]	IB	
[illegible]								IB	
[illegible]								IB	
[illegible]						535-555 FORAMS COMMON,		IB	
[illegible]						ALL A. BECCARII & E.		IB	
[illegible]						CLAVATUM		IB	
560								IB	
[illegible]								IB	
[illegible]								IB	
[illegible]								IB	
[illegible]								IB	
[illegible]						620-625 SAME		IB	
[illegible]								IB	
[illegible]								IB	
[illegible]						645-655 FORAMS ABUNDANT,		IB	
[illegible]						A. BECCARII, E. CLAVA-		IB	
[illegible]						TUM, H. GERMANICA,		IB	
[illegible]						OSTRACODS, DIATOMS		IB	
[illegible]								IB	
710					MOIST			IB	
720								IB	
730								IB	
740								IB	
750						745-750 FORAMS COMMON,		IB	
760						A. BECCARII, E. CLAVA-		IB	
770						TUM, A. SALSUM, RANGIA		IB	
780								IB	
790								IB	
800	SILT	5Y4/1		LOOSE	MOIST	790-795 FORAMS COMMON,	[illegible]	IB	
810						A. BECCARII, E. CLA-		IB	
820						VATUM, E. GALVESTON-		IB	
830						ENSE, A. SALSUM, OSTRA-		IB	
840						CODS, RANGIA		IB	
850		5Y5/1						IB	
860								IB	
870						875-88 FORAMS SPARSE,		IB	
880						E. CLAVATUM, A. SALSUM		IB	
890								IB	
9[illegible]								IB	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,SS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M = Massive P = Parallel L = Lenticular W = Wavy C = Cross R = Ripple SC = Scour & Fill E = Embedded D = Distinct FD = Finely Divided S = Shells B = Burrows LC = Lead casts CT = Cut-stones F = Fractures IN = Inclusions

PLATE A77

BORING NUMBER: LE-11
QUADRANGLE: LOST LAKE
LOCATION: BAYOU DECADE

DRIVE: 7.14m
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	ORGANICS	5Y3/2		FIRM	MOIST	0-5 FORAMS COMMON,	5-13	M	
20	•	•		•	•	T. MACRESCENS, T. COM-	•	M	
30	•	•		•	•	PRIMATA, A. INEPTA, A.	•	M	
40	•	•		•	•	MEXICANA, M. FUSCA	•	M	
50	ORG CLAY	5Y3/1		FIRM	MOIST		5-13	M	
60	•	•		•	•		•	M	
70	•	•		•	•		•	M	
80	•	•		•	•		•	M	
90	•	•		•	•		•	M	
100	SILTY CLAY	2.5Y4/2	2.5Y5/2	FIRM	WET		5	M	
110	•	•	•	•	•	100-110 NO FORAMS, A	•	L	
120	•	•	•	•	•	FEW OSTRACODS	•	L	
130	•	•	•	•	•		•	L	
140	•	•	•	•	•		•	L	
150	SAND	2.5Y4/2		FIRM	WET		5	L	
160	SILTY CLAY	5Y4/1		FIRM	WET		5	L	
170	•	•		•	•		•	L	
180	•	•		•	•	170-175 1 A. INEPTA,	•	L	
190	•	•		•	•	1 A. SALSUM, SEVERAL	•	L	
200	•	•		•	•	OSTRACODS	•	L	
210	•	•		•	•		•	L	
220	•	•		•	•	212-218 NO FORAMS	•	L	
230	•	•		•	•		•	L	
240	•	•		•	•		•	L	
250	•	•		•	•		•	L	
260	•	•		•	•		•	L	
270	•	•		•	•		•	L	
280	SHELL HASH	5Y4/1		FIRM	WET	270-275 SPARSE FORAMS,	5	L	
290	SILTY CLAY	5Y4/1		FIRM	WET	ALL A. SALSUM, FAUNA	5	L	
300	•	•		•	•		•	L	
310	•	•		•	•		•	L	
320	•	•		•	•		•	L	
330	•	•		•	•		•	L	
340	•	•		•	•		•	L	
350	•	•		•	•	345-350 NO FORAMS,	•	L	
360	•	•		•	•	FEW OSTRACODS	•	L	
370	•	•		•	•		•	L	
380	•	•		•	•		•	L	
390	•	•		•	•		•	L	
400	•	•		•	•		•	L	
410	•	•		•	•		•	L	
420	•	•		•	•		•	L	
430	•	•		•	•		•	L	
440	•	•		•	•		•	L	
450	•	•		•	•		•	L	
460	•	•		•	•		•	L	
470	•	•		•	•		•	L	
480	•	•		•	•	470-475 NO FORAMS,	•	L	
490	•	•		•	•	FAUNA	•	M	
500	•	•		•	•	500-505 NO FORAMS	•	M	
510	ORG CLAY	5Y3/1	2.5Y3/0	V. FIRM	MOIST		5	M	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,SS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=beddes D=distinct FD=finely divided S=shells BR=burrows LC=load casts CO=contorted F=fractures IN=inclusions

PLATE A78

BORING NUMBER: LB-11
QUADRANGLE: LOST LAKE
LOCATION: BAYOU DECADE

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	B	SE	R	D	FD	H	S	BR	LC	BI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520		ORG CLAY	5Y3/1	2.5Y3/0	V. FIRM	MOIST	*										*								.5	M	
530		*	*	*	*	*	*										*								*	M	
540		*	*	*	*	*	*										*								*	M	
550		*	*	*	*	*	*										*								*	*	
560		*	*	*	*	*	*										*								*	*	
570		CLAY	[illegible]		V. FIRM	MOIST	*										*								5	M	
575		*	*		*	*	*										*								*	M	
580		PEAT					*										*								.5	M	
590		*	*				*										*								*	M	
600		*	*				*										*							595-600 NO FORAMS	*	M	

DEPOSITIONAL ENVIRONMENTS: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MF = Mudflat S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=disseminated FD=[illegible] H=[illegible] S=[illegible] BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A79

BORING NUMBER: BOL-3
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	BR	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		CLAYEY	2.5Y4/4	7.5YR5/4	FIRM	MOIST	•		•		<5	NL	
20		SILT	•	•	•	•	•		•		•	NL	
30		•	•	•	•	•	•		•		•	NL	
40		•	•	•	•	•	•		•		•	NL	
50		•	•	•	•	•	•		•		•	NL	
60		•	•	•	•	•	•		•	50-55 NO FORAMS	•	NL	
70		•	•	•	•	•	•		•		•	NL	
80		•	•	•	•	•	•		•		•	NL	
90		•	•	•	•	•	•		•		•	NL	
100		•	•	•	•	•	•		•		•	NL	
110		•	•	•	•	•	•		•		•	NL	
120		•	•	•	•	•	•		•		•	NL	
130		NO SAMPLE											
140		NO SAMPLE											
150		NO SAMPLE											
160		NO SAMPLE											
170		NO SAMPLE											
180		NO SAMPLE											
190		NO SAMPLE											
200		NO SAMPLE											
210		NO SAMPLE											
220		NO SAMPLE											
230		NO SAMPLE											
240		NO SAMPLE											
245		NO SAMPLE											
250		CLAYEY	2.5Y4/2		FIRM	MOIST	•		•		<5	NL	
260		SILT	•		•	•	•		•	250-252 NO FORAMS	•	NL	
270		•	•		•	•	•		•		•	NL	
280		•	•		•	•	•		•		•	NL	
290		•	•		•	•	•		•		•	NL	
300		•	•		•	•	•		•	294-298 RELICT FORAMS, NO HOLOCENE FORAMS	•	NL	
310		NO SAMPLE											
320		NO SAMPLE											
330		NO SAMPLE											
340		NO SAMPLE											
350		NO SAMPLE											
360		NO SAMPLE											
365		NO SAMPLE											
370		FINE SAND	[illegible]		[illegible]	WET	•			[illegible] NO FORAMS	<5	CC	
380		•	•		•	•	•				•	CC	
390		•	•		•	•	•				•	CC	
400		•	•		•	•	•				•	CC	
410		•	•		•	•	•				•	CC	
420		•	•		•	•	•				•	CC	
430		•	•		•	•	•				•	CC	
440		•	•		•	•		•			•	CC	
450		CLAY	2.5Y4/2		V. FIRM	MOIST		•		441-445 NO FORAMS	•	CC	
460		FINE SAND	5Y4/2		FIRM	WET					•	CC	
470		•	•		•	•					•	CC	
480		•	•		•	•					•	CC	
495		•	•		•	•					•	CC	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A80

BORING NUMBER: BBL-2
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

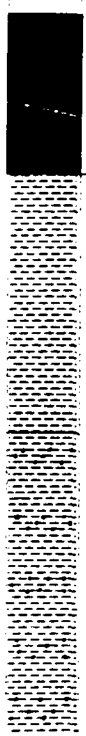
DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
490		FINE SAND	5Y4/1		FIRM	WET		•	CC	
500		•	•		•	•		•	CC	
510		•	•		•	•	510-512 RELICT FORAMS,	•	CC	
520		•	•		•	•	RARE HOLOCENE FORAMS	•	CC	
530		•	•		•	•		•	CC	
540		•	•		•	•		•	CC	
550		•	•		•	•		•	CC	
560		•	•		•	•		•	CC	
570		CLAYEY SILT	2.5Y4/1		FIRM	MOIST		S	CC	
580			•		•	•		•	CC	
590		•	•		•	•		•	CC	
600		•	•		•	•		•	CC	
605		•	•		•	•		•	CC	
610		•	•		•	•	600-606 NO FORAMS	•	CC	
620		•	•		•	•		•	CC	
630		•	•		•	•		•	CC	
640		•	•		•	•		•	CC	
650		•	•		•	•		•	CC	
660		•	•		•	•		•	CC	
670		•	•		•	•		•	CC	
680		•	•		•	•		•	CC	
690		•	•		•	•		•	CC	
700		•	•		•	•	695-700 NO FORAMS	•	CC	
710		•	•		•	•		•	CC	
720		•	•		•	•		•	CC	
730		NO SAMPLE								
740		NO SAMPLE								
750		NO SAMPLE								
760		NO SAMPLE								
770		NO SAMPLE								
780		NO SAMPLE								
790		NO SAMPLE								
800		SAND	2.5Y4/2		FIRM	MOIST		S	CC	
810		•	•		•	•		•	CC	
820		•	•		•	•	815-817 NO FORAMS	•	CC	
830		•	•		•	•		•	CC	
840		•	•		•	•	838-840 NO FORAMS	•	CC	
850		•	•		•	•		•	CC	
860		•	•		•	•		•	CC	
870		•	•		•	•		•	CC	
880		•	•		•	•		•	CC	
890		•	•		•	•		•	CC	
900		•	•		•	•		•	CC	
910		SHELL	[illegible]		FIRM	MOIST	[illegible] NO FORAMS	S	CC	
920		[illegible]	[illegible]		[illegible]	[illegible]	RANGIA			
930		•	•		•	•	934-940 NO FORAMS, RANGIA	•	•	
940		NO SAMPLE								
950		NO SAMPLE								
960		NO SAMPLE								
970		NO SAMPLE								
980		NO SAMPLE								

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee ID = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,ES = Inland or Back Swamp CC = Crevasse Channel ST = Subtidal
STRATIGRAPHY: M=assive P=arallel L=enticular W=avy C=ross R=ipple SC=our & Fill, B=edded ...

PLATE A81

BORING NUMBER: BOL-2
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:



DEPTH: CM	TEXTURE	COLOR	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY
990	NO SAMPLE				
1000	NO SAMPLE				
1010	NO SAMPLE				
1020	NO SAMPLE				
1030	NO SAMPLE				
1035	NO SAMPLE				
1040	PEAT		FIRM	MOIST	
1070					[illegible] NO FORAMS
1140	CLAY	5Y4/1	V. FIRM	MOIST	1140-1150 FORAMS COMMON, CALCAREOUS
1160					1160-1165 FORAMS SPARSE, CALCAREOUS
1210					1205-1208 NO FORAMS
1300	SILT & CLAY LAMS.	5Y4/1	FIRM	MOIST	
1350					1341-1345 CALCAREOUS HOLOCENE FORAMS ABUNDANT, RELICT FORAMS COMMON
1400					1394-1397 CALCAREOUS HOLOCENE FORAMS ABUNDANT, RELICT FORAMS COMMON

Column headings: DEPTH: CM, LITHOLOGY, TEXTURE, COLOR, MOTTLES, CONSISTENCY, MOISTURE, (M P LAMINATIONS L W C R) (SE B ORGANICS D ED R) (S (SECONDARY STRUCTURE) BR LC DT F IN), BIOSTRATIGRAPHY, SAL, DEPOSIT ENVIRON, REMARKS

Depths: 990, 1000, 1010, 1020, 1030, 1035, 1040, 1050, 1060, 1070, 1080, 1090, 1100, 1110, 1120, 1130, 1140, 1150, 1160, 1170, 1180, 1190, 1200, 1210, 1220, 1230, 1240, 1250, 1260, 1270, 1280, 1290, 1300, 1310, 1320, 1330, 1340, 1350, 1360, 1370, 1380, 1390, 1400, 1410, 1420, 1430, 1440, 1450, 1460, 1470, 1480

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IE = Interdistributary Bay CF = Channel Fill LC = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel [illegible]
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple S=scour E=e.l. E=embedded D=distinct F=finely divided S=shells B=burrows LC=load casts D=distorted F=fractures IN=inclusions

PLATE A82

BORING NUMBER: BOL-7
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
1490		SILT &	5Y4/1		FIRM	MOIST	1465-1489 FORAMS COMMON	•	L	
1500		CLAY LAMS.	•		•	•		•	L	
1510		•	•		•	•		•	L	
1515		•	•		•	•		•	L	
1520		•	•		•	•	1510-1520 FORAMS RARE	•	L	
1530		•	•		•	•		•	L	
1540		•	•		•	•		•	L	
1550		•	•		•	•		•	L	
1560		•	•		•	•		•	L	
1570		•	•		•	•		•	L	
1580		•	•		•	•	1574-1579 CALCAREOUS	•	L	
1585		•	•		•	•	FORAMS ABUNDANT	•	L	
1590		•	•		•	•		•	L	
1600		•	•		•	•		•	L	
1610		•	•		•	•		•	L	
1620		•	•		•	•		•	L	
1630		•	•		•	•		•	L	
1640		•	•		•	•		•	L	
1650		•	•		•	•	1640-1645 CALCAREOUS	•	L	
1660		•	•		•	•	FORAMS COMMON	•	L	
1670		•	•		•	•		•	L	
1680		•	•		•	•		•	L	
1690		•	•		•	•		•	L	
1700		•	•		•	•	1690-1693 CALCAREOUS	•	L	
1710		•	•		•	•	FORAMS SPARSE	•	L	
1720		•	•		•	•		•	L	
1730		•	•		•	•		•	L	
1740		•	•		•	•		•	L	
1750		•	•		•	•		•	L	
1760		•	•		•	•		•	L	
1765		•	•		•	•		•	L	
1770		CLAY	5Y5/1		V. FIRM	MOIST		IB-IC	L	
1780		•	•		•	•		•	L	
1790		•	•		•	•		•	L	
1800		•	•		•	•		•	L	
1810		•	•		•	•		•	L	
1820		•	•		•	•		•	L	
1830		•	•		•	•		•	L	
1835		•	•		•	•	1830-1835 CALCAREOUS	•	L	
1840		•	•		•	•	FORAMS ABUNDANT		L	
1850		SHELL HASH	5Y5/1		V. FIRM	MOIST			L	
1855		CLAY			V. FIRM	MOIST	1854-1859 NO FORAMS		L	
1860		•			•	•		S	L	
1870		•			•	•		•	L	
1880		•			•	•		•	L	
1890		•			•	•		•	L	
1897		SILT &	5Y4/1		FIRM	MOIST	1895-1900 FORAMS RARE	IB	L	
1900		CLAY LAMS.	•		•	•		•	L	
1910		•	•		•	•		•	L	
1920		•	•		•	•		•	L	
1930		•	•		•	•		•	L	

LAMINATIONS: M P L W C R SE — ORGANICS: B R FD M S — SECONDARY STRUCTURE: BR LC BT F IN

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay C = Channel Fill LC = Lacustrine Delta MT = Midden S = Spoil IN/S = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour - = bedded D=distinct I=indistinct B=burrows FD=root casts D=distorted F=fractures IN=inclusions

PLATE A84

BORING NUMBER: [illegible]
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH, cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
194[illegible]	SILT &	5Y4/1		FIRM	MOIST		•	L	
1950	CLAY LAMS.	•		•	•		•	L	
1960	•	•		•	•		•	L	
1970	•	•		•	•	1962-1965 FORAMS RARE,	•	L	
1980	•	•		•	•	OSTRACODS	•	L	
1990	CLAY	5Y4/1		FIRM	MOIST		5	L	
1995	•	•		•	•	1995-2001 FORAMS RARE	•	L	
2000	•	•		•	•		•	L	
2010	•	•		•	•		•	L	
2020	•	•		•	•		•	L	
2030	ORG CLAY	5Y4/1		V. FIRM	MOIST		5	L	
2040	•	•		•	•		•	L	
2050	•	•		•	•		•	L	
2060	•	•		•	•		•	L	
2070	•	•		•	•	2065-2071 NO FORAMS	•	L	
2080	•	•		•	•		•	L	
2090	•	•		•	•		•	L	
2100	•	•		•	•		•	L	
2110	•	•		•	•		•	L	
2120	•	•		•	•		•	L	
2130	•	•		•	•	2123-2126 NO FORAMS	•	L	
2140	•	•		•	•		•	L	
2150	•	•		•	•		•	L	
2160	•	•		•	•		•	L	
2170	•	•		•	•		•	L	
2180	•	•		•	•		•	L	
2190	•	•		•	•		•	L	
2200	SILT &	5Y4/1		V. FIRM	MOIST		5	L	
2210	CLAY LAMS.	•		•	•		•	L	
2220	•	•		•	•	2219-2224 SPARSE RELICT	•	L	
2230	•	•		•	•	IN HOLOCENE FORAMS	•	L	
2240	•	•		•	•		•	L	
2250	•	•		•	•		•	L	
2260	•	•		•	•		•	L	
2270	•	•		•	•		•	L	
2280	•	•		•	•	2275-2277 NO FORAMS	•	L	
2290	•	•		•	•	2283-2285 NO FORAMS	•	L	
2300	•	•		•	•		•	L	
2310	•	•		•	•	2305-2310 NO FORAMS	•	L	
2320	•	•		•	•	2316-2320 NO FORAMS	•	L	
2330	•	•		•	•		•	L	
2335	•	•		•	•	2331-2335 FORAMS RARE,	•	L	
2340	•	•		•	•	OSTRACODS		L	
2350	•	•		•	•			L	
2360	•	•		•	•	2351-2354 CALCAREOUS	5-10	L	
2370	•	•		•	•	FORAMS COMMON	•	L	
2380	•	•		•	•		•	L	
2390	•	•		•	•		•	L	
2400	•	•		•	•		•	L	
2410	•	•		•	•		•	L	
2420	•	•		•	•		•	L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta ML = Middens S = Spoil IS/BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: 60L-2
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(R	P	LAMINATIONS L	W	C	H)	SE	(B	ORGANICS FD	M)	S	(SECONDARY STRUCTURE) BR	LG	RI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
2430		SILT &	5Y4/1		V. FIRM	MOIST		•										•						•	L	
2440		CLAY LAMS.	•		•	•		•										•						•	L	
2450		•	•		•	•		•										•					2449-2452 CALCAREOUS	•	L	
2460		•	•		•	•		•										•					FORAMS COMMON, OSTRACODS	•	L	
2470		•	•		•	•												•						•	L	
2480		•	•		•	•												•						•	L	
2490		•	•		•	•												•						•	L	
2495		•	•		•	•												•						•	L	
2500		•	•		•	•		•		•								•						•	L	
2510		•	•		•	•		•		•								•						•	L	
2520		•	•		•	•		•		•								•						•	L	
2530		•	•		•	•		•		•														•	L	
2540		•	•		•	•		•		•													2530-2535 RARE FORAMS,	•	L	
2550		•	•		•	•		•		•													OSTRACODS	•	L	
2555		•	•		•	•		•		•													2549-2555 ABUNDANT	•	L	
2560		•	•		•	•		•		•													CALCAREOUS FORAMS &		L	
2570		CLAYEY	2.5Y4/2		V. FIRM	MOIST	•																OSTRACODS		L	
2580		SILT	•		•	•	•																		L	
2585		•	•		•	•	•																		L	
2590		•	•		•	•	•																2585-2587 NO FORAMS	<5	L	
2600		•	•		•	•	•																	•	L	
2610		•	•		•	•	•																	•	L	
2620		•	•		•	•	•																	•	L	
2630		•	•		•	•		•			•												2620-2625 NO HOLOCENE	•	L	
2640		•	•		•	•		•			•												FORAMS, RELICT FORAMS	•	L	
2650		•	•		•	•		•			•													•	L	
2660		•	•		•	•		•			•													•	L	
2670		•	•		•	•		•			•													•	L	
2680		•	•		•	•		•																•	L	
2685		•	•		•	•		•																•	L	
2690		•	•		•	•	•	•																•	L	
2700		•	•		•	•	•																	•	L	
2710		•	•		•	•	•																	•	L	
2720		•	•		•	•	•																	•	L	
2730		•	•		•	•	•																	•	L	
2740		•	•		•	•	•																	•	L	
2750		•	•		•	•	•																	•	L	
2760		•	•		•	•	•																2750-2755 NO HOLOCENE	•	L	
2770		•	•		•	•	•																FORAMS, RELICT FORAMS	•	L	
2780		•	•		•	•	•																2763-2766 NO HOLOCENE	•	L	
2790		•	•		•	•	•																FORAMS, RELICT FORAMS	•	L	
2800		CLAY	5Y[illegible]/2		V. FIRM	MOIST	•																2790-2795 NO FORAMS	<5	IS	
2810		•	•		•	•	•																2800-2802 NO FORAMS	•	IS	
2820		•	•		•	•	•							•										•	IS	
2830		•	•		•	•	•							•									2829-2834 NO FORAMS,	•	IS	
2840		•	•		•	•	•							•									OSTRACODS	•	IS	
2850		•	•		•	•	•							•										•	IS	
2860		•	•		•	•	•							•										•	IS	
2870		•	•		•	•	•																	•	IS	
2880		•	•		•	•	•																	•	IS	
2890		•	•		•	•	•																	•	IS	

DEPOSITIONAL ENVIRONMENTS: M = Marsh NL = Natural Levee ID = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A85

PLATE A86

BORING NUMBER: BOL-2
QUADRANGLE:
LOCATION:

DRIVE:
LOSS:
SAMPLE LENGTH:

DEPTH, CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	M	P	L	W	C	R	SE	B	D	FD	W	S	BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
2900		CLAY	5Y5/2		V. FIRM	MOIST	•																		•	IS	
2910		•	•		•	•	•																		•	IS	
2920		•	•		•	•	•																		•	IS	
2930		•	•		•	•	•																		•	IS	
2940		•	•		•	•	•																•		•	IS	
2950		•	•		•	•	•																•	2945-2951 NO FORAMS	•	IS	
2960		•	•		•	•	•																•		•	IS	
2970		•	•		•	•	•																•		•	IS	
2980		•	•		•	•	•																•		•	IS	
2990		•	•		•	•	•																	2987-2990 NO FORAMS	•	IS	
3000		•	•		•	•	•									•									•	IS	
3010		•	•		•	•	•									•									•	IS	
3020		•	•		•	•	•									•									•	IS	
3030		•	•		•	•	•									•									•	IS	
3040		•	•		•	•	•									•									•	IS	
3050		•	•		•	•	•									•								3045-3048 NO FORAMS	•	IS	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MD = Mudflat S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: [illegible]
QUADRANGLE: LAKE THERIOT
LOCATION: [illegible] RIDGE

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	ORGANICS	[illegible]		LOOSE	WET			M	
20								M	
30						…-30 NO FORAMS		M	
40								M	
50								M	
60	ORG CLAY	[illegible]		FIRM	WET			M	
70								M	
80								M	
90								M	
100	[illegible]	[illegible]		[illegible]	[illegible]			IS	
110								IS	
120				SL. FIRM		110-120 NO FORAMS		IS	
130								IS	
140								IS	
150								IS	
160								IS	
170								IS	
180								IS	
190								IS	
200								IS	
210								IS	
220								IS	
230								IS	
240					V. WET			IS	
250								IS	
260								IS	
270								IS	
280						276-283 NO FORAMS,		IS	
290			[illegible]			SEVERAL OSTRACODS		IS	
300					WET	298-301 NO FORAMS		IS	[illegible]
310		5Y4/1				SEVERAL OSTRACODS		IS	[illegible]
320					MOIST		[illegible]	IS	
330								IS	
340								IS	
350						…-347 FORAMS COMMON,		IS	
360		[illegible]				ALL A. SALSUM, MANY		IS	
370						OSTRACODS		IS	
380								IS	
390								IS	
400						…-… MANY FORAMS,		IS	
410	[illegible]					[illegible]		M	
420								M	
430						…-43… NO FORAMS		M	
440								M	
450	ORG CLAY	5Y4/1		FIRM	MOIST			M	[illegible]
460								M	[illegible]
470						…-467 FORAMS COMMON,		M	
480						A. INEPTA, A. MEXICANA,		M	
490						TROCHAMMINA SP		M	
500								M	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IS = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IS/BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SE=scour & fill B=bedded D=distinct FD=finely divided S=shells B=burrows C=cast casts D=distorted F=fractures IN=inclusions

PLATE A87

PLATE A88

BORING NUMBER: [illegible]
QUADRANGLE: LAKE [illegible]
LOCATION: MARMANDE RIDGE

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SF	ORGANICS B	D	FD	W	S	SECONDARY STRUCTURE BR	LC	RT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
[illegible]		PEAT			FIRM	MOIST																		[illegible]			

DEPOSITIONAL ENVIRONMENTS: M = Marsh, NL = Natural Levee, IB = Interdistributary Bay, CF = Channel Fill, LD = Lacustrine Delta, MI = Midden, S = Soil, IN/SS = Inland or Back Swamp, CC = Crevasse Channel, ST = Substratum
STRATIGRAPHY: M=Massive P=Parallel L=Lenticular W=Wavy C=Cross R=Ripple SF=Scour & Fill B=Bedded D=Distinct FD=Finely divided S=Shells BR=Burrows LC=Lined casts RT=Rootlets F=Fractures IN=Inclusions

BORING NUMBER: BOL-4
QUADRANGLE: LAKE PENCHANT
LOCATION: BAYOU MAUVAIS BOIS

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		ORGANICS	10YR2/1		LOOSE TO	MOIST	0-5 SPARSE FORAMS, T.	5-13	M	
20		•	•		SL. FIRM	•	INFLATA, T. [illegible]ARIS,	•	M	
30		•	•		•	•	T. MACRESCENS, A.	•	M	
40		•	•		•	•	SALSA, A. [illegible],	•	M	
50		CLAY	5Y4/[illegible]	10YR5/[illegible]	V. FIRM	MOIST	OSTRACODS	•	CF	
60		•	•	•	•	•	50-55 NO FORAMS	•	CF	
70		•	•	•	•	•		•	CF	
80		•	•	•	•	•		•	CF	
90		•	•	•	•	•		•	CF	
100		•	•	•	•	•		•	CF	
110		•	•	•	•	•		•	CF	
120		•	•	•	•	•		•	CF	
130		•	•	•	•	•		•	CF	
140		•	•	•	•	•		•	CF	
150		•	•	•	•	•		•	CF	
160		•	•	•	•	•		•	CF	
170		SAND	2.5Y4/2		V. FIRM	MOIST	16[illegible]-17[illegible] NO FORAMS	•	CF	
180		•	•		•	•		•	CF	
190		SILTY CLAY	2.5Y4/2		V. FIRM	MOIST		•	CF	
200		•	•		•	•		•	CF	
210		•	•		•	•		•	CF	
220		•	•		•	•		•	CF	
230		•	•		•	•		•	CF	
240		•	•		•	•		•	CF	
250		•	•		•	•		•	CF	
260		•	•		•	•	25[illegible]-255 NO FORAMS	•	CF	
270		SHELL HASH	2.5Y4/2		V. FIRM	MOIST	26[illegible]-27[illegible] SPARSE FORAMS,	13-[illegible]	CF	
280		SILTY CLAY	2.5Y4/2		V. FIRM	MOIST	A. BECCARII, E. CLAVA-	13-[illegible]	CF	
290		•	•		•	•	TUM, RANGIA	•	CF	
300		•	•		•	•		•	CF	
310		•	•		•	•	302-307 1 CALCAREOUS	•	CF	
320		•	•		•	•	FORAM	•	CF	
330		•	•		•	•		•	CF	
340		SHELL HASH	2.5Y4/2		V. FIRM	MOIST	34[illegible]-351 FORAMS COMMON,	•	CF	
350		•	•		•	•	A. SALSUM, H. MANILEAN-	•	CF	
360		[illegible]	5Y4/[illegible]		[illegible] FIRM	MOIST	SIS, A. BECCARII, E.	•	M	[illegible]
370		•	•		•	•	GUNTERI, MANY	•	M	ROOTS
380		•	•		•	•	OSTRACODS, RANGIA	•	M	•
390		•	•		•	•	385-39[illegible] 1 CALCAREOUS	•	M	•
400		•	•		•	•	FORAM	•	M	•

DEPOSITIONAL ENVIRONMENTS: M = Marsh, NL = Natural Levee, IB = Interdistributary Bay, CF = Channel Fill, LD = Lacustrine Delta, [illegible], CC = Crevasse Channel, ST = Substratum
[illegible]

PLATE A89

BORING NUMBER: BOL-8
QUADRANGLE: LAKE PENCHANT
LOCATION: BAYOU PENCHANT

DRIVE: 0.61m
LOSS:
SAMPLE LENGTH: 0.61m

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SF	ORGANICS B	D	FD	S	B	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		ORG CLAY	7.5YR2/0		FIRM	WET											•							5-10 NO FORAMS	<5	M	
20		•	•		•	•											•								•	M	
30		•	•		•	•											•								•	M	
40		•	•		•	•											•								•	M	
50		•	•		•	•											•								•	M	
60		•	•		•	•											•								•	M	
70		•	•		•	•											•								•	M	
80		•	•		•	•											•								•	M	
90		•	•		•	•											•								•	M	
100		•	•		•	•											•								•	M	
110		•	•		•	•											•								•	M	
120		•	•		•	•											•							120-125 NO FORAMS	•	M	
130		•	•		•	•											•								•	M	
140		•	•		•	•											•								•	M	
150		•	•		•	•											•								•	M	
160		•	•		•	•											•								•	M	
170		•	•		•	•											•								•	M	
180		•	•		•	•											•								•	M	
190		•	•		•	•											•								•	M	
200		SILTY CLAY	10YR3/1		FIRM	MOIST	•	•								•									<5	CF	
210		•	•		•	•	•	•								•									•	CF	
220		•	•		•	•	•	•								•								220-225 NO FORAMS	•	CF	
230		•	•		•	•	•	•								•									•	CF	
240		•	•		•	•	•	•								•									•	CF	
250		•	•		•	•	•	•								•									•	CF	
260		SILTY CLAY	10YR5/1	10YR4/6	FIRM	MOIST	•	•													•	•		250-255 NO FORAMS	<5	CF	• FRACTURE
270		•	•	•	•	•	•	•													•				•	CF	WITH OXIDA-
280		•	•	•	•	•	•	•													•				•	CF	TION FROM
290		•	•	•	•	•	•	•													•				•	CF	250-300 CM.
300		•	•	•	•	•	•	•													•				•	CF	
310		•	•	•	•	•	•																		•	CF	
320		CLAY W/ORG	10YR3/1		V. FIRM	MOIST										•							•	320-325 NO FORAMS	<5	CF	VIVIANITE
330		•	•		•	•										•									•	CF	
340		•	•		•	•										•									•	CF	
350		CLAY	5Y3/2	5Y6/3	V. FIRM	MOIST	•																		<5	CF	
360		•	•	•	•	•	•																		•	CF	
370		•	•	•	•	•	•																		•	CF	
380		•	•	•	•	•	•																		•	CF	
390		•	•	•	•	•	•																		•	CF	
400		•	•	•	•	•	•																		•	CF	
410		•	•	•	•	•	•																		•	CF	
420		•	•	•	•	•	•																		•	CF	
430		•	•	•	•	•	•																	425-430 NO FORAMS	•	CF	
440		•	•	•	•	•	•																		•	CF	
450		•	•	•	•	•	•																		•	CF	
460		•	•	•	•	•	•																		•	CF	
470		•	•	•	•	•	•																		•	CF	
480		•	•	•	•	•	•																		•	CF	
490		•	•	•	•	•	•																		•	CF	
500		•	•	•	•	•	•																		•	CF	
510		•	•	•	•	•	•																		•	CF	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A90

BORING NUMBER: BPL-8
QUADRANGLE: LAKE PENCHANT
LOCATION: BAYOU PENCHANT

DRIVE: 8.61m
LOSS:
SAMPLE LENGTH: 8.61m

DEPTH cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(		LAMINATIONS				)	(		ORGANICS	)	(SECONDARY STRUCTURE)						BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
							M	P	L	W	C	R	SE	B	R	FD	W	S	BB	LC	DT	F	IN				
520		CLAY	5Y3/2	5Y6/3	V. FIRM	MOIST	•																		.5	CF	
530		•	•	•	•	•	•																		•	CF	
540		•	•	•	•	•	•																		•	CF	
550		•	•	•	•	•	•																	545-550 NO FORAMS	•	CF	
560		•	•	•	•	•	•																		•	CF	
570		•	•	•	•	•	•																		•	CF	
580		•	•	•	•	•	•																		•	CF	
590		•	•	•	•	•	•																		•	CF	
600		CLAY W	5Y3/2	5Y6/3	V. FIRM	MOIST		•								•									.5	CF	
610		1%-20%	•	•	•	•		•								•									•	CF	
620		SILT/SAND	•	•	•	•		•								•									•	CF	
630		LAM.	•	•	•	•		•								•									•	CF	
640		•	•	•	•	•		•								•									•	CF	
650		•	•	•	•	•		•								•									•	CF	
660		•	•	•	•	•		•								•									•	CF	
670		•	•	•	•	•		•								•								670-673 NO FORAMS,	•	CF	
680		•	•	•	•	•		•								•								1 OSTRACOD	•	CF	
690		•	•	•	•	•		•								•									•	CF	
700		•	•	•	•	•		•								•									•	CF	
710		•	•	•	•	•		•								•									•	CF	
720		•	•	•	•	•		•								•									•	CF	
730		•	•	•	•	•		•								•									•	CF	
740		•	•	•	•	•		•								•									•	CF	
750		•	•	•	•	•		•								•								745-750 NO FORAMS,FEW	•	CF	
760		•	•	•	•	•		•								•								OSTRACODS	•	CF	
770		•	•	•	•	•		•								•									•	CF	
780		•	•	•	•	•		•								•									•	CF	
790		•	•	•	•	•		•								•									•	CF	
800		•	•	•	•	•		•								•									•	CF	
810		•	•	•	•	•		•								•									•	CF	
820		•	•	•	•	•		•								•									•	CF	
830		•	•	•	•	•		•								•								827-830 NO FORAMS	•	CF	
840		•	•	•	•	•		•								•									•	CF	
850		•	•	•	•	•		•								•									•	CF	
860		•	•	•	•	•		•								•									•	CF	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = S... IN,BS = Inland or Back Swamp CC = Crevasse Channel SI = S...
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BB=burrows LC=clay casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: [illegible]
QUADRANGLE: LAKE PENCHANT
LOCATION: BAYOU PENCHANT

DRIVE: [illegible]
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	[LAMINATIONS M	P	L	W	C	R	SE]	[ORGANICS B	D	FD	H]	S	(SECONDARY STRUCTURE) BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		CLAY	[illegible]		LOOSE	V. WET	*										*									*	
20		*	*		*	*	*										*									*	
30		*	*		*	*	*										*									*	
40		*	*		*	*	*										*									*	
50		*	*		*	*	*										*									*	
60		*	5Y3/2		FIRM	*	*										*									M	
70		*	*		*	*	*										*									M	
80		*	*		*	*	*										*									M	
90		*	5Y4/2		*	*	*										*									M	
100		*	*		*	WE	*																			CF	
110		*	*		*	*	*																			CF	
120		*	*		*	*	*																			CF	
130		*	*		*	*	*																			CF	
140		*	*		*	*	*																			CF	
150		*	*		*	*	*																			CF	
160		*	*		*	*	*																			CF	
170		*	*		*	*	*																			CF	
180		*	*		*	*	*																			CF	
190		*	*		*	*	*																			CF	
200		*	*		*	*	*																			CF	
210		*	*		*	*	*																			CF	
220		*	*		*	*	*																			CF	
230		*	*		*	*	*																			CF	
240		*	*		*	*	*														*					CF	
250		*	*		*	*	*														*					CF	
260		*	*		*	*	*																			CF	
270		*	*		*	*	*																			CF	
280		*	*		*	*	*																			CF	
290		*	5Y3/2		*	*	*																			CF	
300		*	*		*	*	*																			CF	
310		*	*		*	*	*																			CF	
320		*	*		*	*	*																			CF	
330		*	*		*	*	*																			CF	
340		*	*		*	*	*																			CF	
350		*	*		*	*	*																			CF	
360		*	*		*	*		*		*											*					CF	
370		*	*		*	*		*		*											*					CF	
380		*	*		*	*		*		*											*					CF	
390		*	*		*	*		*		*											*					CF	
400		SILT	5Y3/2		FIRM	WET		*		*											*					CF	
410		*	*		*	*		*		*											*					CF	
420		*	*		*	*		*		*											*					CF	
430		CLAY	5Y3/2		FIRM	WET		*		*											*					CF	
440		*	*		*	*		*		*											*					CF	
450		*	*		*	*		*		*											*					CF	
460		SILT &	5Y3/2		V. FIRM	WET	*											*								CF	
470		CLAY LAMS.	*		*	*	*																			CF	
480		*	*		*	*	*																			CF	
490		*	*		*	*	*																			CF	
500		*	*	5Y4/2	*	MOIST	*																			CF	
510		*	*	*	*	*		*		*																CF	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SE=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A92

BORING NUMBER: [illegible]
QUADRANGLE: LAKE PENCHANT
LOCATION: BAYOU PENCHANT

DRIVE: 5.65m
LOSS:
SAMPLE LENGTH: [illegible]

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(LAMINATIONS) M P L W C R SC	(ORGANICS) R P FD W	S	(SECONDARY STRUCTURE) BB LC DI F IB	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520 -		SILT & CLAY LAMS.	5Y 5/2	5Y4/2	V. FIRM	MOIST							DE	
530 -														
540 -														
550 -														
560 -														
565 -														

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IE = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded I=distinct FD=finely divided S=shells B=burrows LC=load casts DI=distorted F=fractures IB=inclusions

PLATE A93

BORING NUMBER: BAL-10
QUADRANGLE: LAKE PEACHANT
LOCATION: LAKE PEACHANT

DRIVE: 7.35M
LOGS:
SAMPLE LENGTH: 6.20M

DEPTH: CM	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SC	ORGANICS B	P	FD	W	S	SECONDARY STRUCTURE BR	LC	DI	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	ORGANICS	10YR2/1		LOOSE	WET											•							0-5 NO FORAMS	<5%	M	
20																•									M	
30																•									M	
40																•									M	
50																•									P	
60																•									P	
70																•									M	
80																•									M	
90	ORG CLAY	5Y2.5/1		LOOSE	WET		•									•		•							P	
100							•											•							M	
110							•											•							M	
120							•											•							M	
130						•												•							M	
140						•												•							M	
150						•												•							M	
160						•												•							M	
170						•												•							M	
180						•												•							M	
190						•												•							M	
200						•												•							M	
210						•												•							M	
220						•												•							M	
230						•												•							M	
240							•											•							CF	
250							•											•							CF	
260							•											•					260-264 NO FORAMS		CF	
270							•											•					270-275 NO FORAMS		CF	
280							•											•					A FEW OSTRACODS		CF	
290	CLAY	2.5Y4/2		FIRM	MOIST		•		•																CF	
300							•		•																CF	
310							•		•																CF	
320							•		•																CF	
330	PEAT	BLACK														•									CF	
340	CLAY	2.5Y3/2		FIRM	WET		•		•																CF	
350							•		•																CF	
360							•		•																CF	
370							•		•																CF	
380						•																			CF	
390						•																			CF	
400						•																			CF	
410						•																			CF	
420						•																			CF	
430						•																			CF	
440						•																			CF	
450						•																			CF	
460						•																			CF	
470						•																			CF	
480						•																			CF	
490						•																			CF	
500						•																			CF	
510						•																			CF	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee ID = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclusions

PLATE A94

BORING NUMBER: BOL-10
QUADRANGLE: LAKE PENCHANT
LOCATION: LAKE PENCHANT

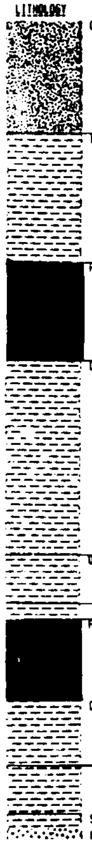
DRIVE: 7.35M
LOSS:
SAMPLE LENGTH: 6.20M

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	LAMINATIONS M	P	L	W	C	R	SC	ORGANICS B	D	FD	U	S	SECONDARY STRUCTURE BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
520 -		CLAY	2.5Y3/2		FIRM	WET		*																			
530 -								*																		CF	
540 -								*																		CF	
550 -								*																		CF	
560 -								*																		CF	
570 -							*																			CF	
580 -							*																			CF	
590 -							*																			CF	
																								600 CM NO FORAMS		CF	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee ID = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRUCTURE: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: BA-11
QUADRANGLE: BAYOU COCODRIE
LOCATION: BAYOU CUPASAN

DRIVE: 0.26M
LOSS:
SAMPLE LENGTH: 7.77M



TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
ORGANICS	10YR2/1		LOOSE	WET	0-5 NONE	<5	M	
ORG CLAY	5Y3/1		FIRM	WET			NL	
PEAT	10YR2/1		FIRM	MOIST			M	
CLAY	5Y5/1		V. FIRM	MOIST	NONE	<5	IB	
ORG CLAY	10YR3/1		FIRM	MOIST		5-13	M	PYRT ROOTS
							IB	
PEAT	10YR2/1		FIRM	MOIST			M	
CLAY	5Y5/1		V. FIRM	MOIST	445-450 NO FORAMS SPARSE DIATOMS	0	M	PYRT ROOTS
SAND-CLAY LAMS	10YR4/1		V.FIRM	MOIST			L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A96

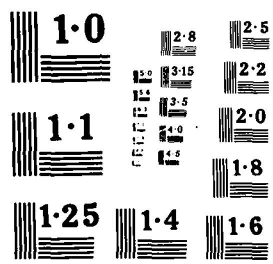
AD-A168 865 GEOMORPHOLOGICAL INVESTIGATION OF THE ATCHAFALAYA BASIN AREA WEST ATCHAFA..(U) ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS GEOTE.. 3/3

UNCLASSIFIED L M SMITH ET AL. APR 86 F/G 8/6 NL

END

DATE FILMED

8-86


1·0
2·8
2·5
3·15
2·2
3·5
2·0
1·1
4·0
4·5
1·8
1·25
1·4
1·6

BORING NUMBER: BOL-11
QUADRANGLE: BAYOU COCODRIE
LOCATION: BAYOU COPASAW

DRIVE: 8.26M
LOSS:
SAMPLE LENGTH: 7.77M

DEPTH	CO	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	[LAMINATIONS] M	P	L	W	C	R	SE	[ORGANICS] R	P	FD	W	S	(SECONDARY STRUCTURE) BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
52	-		SAND-CLAY	10YR4/1		V.FIRM	MOIST	*																			L	
53	-		LAMS					*																	534-540 NO FORAMS,		L	
54	-							*																	OSTRACODS COMMON		L	
55	-							*																			L	
56	-							*																			L	
57	-							*																			L	
58	-							*																			L	
59	-							*																			L	
60	-							*																			L	
61	-							*																			L	
62	-							*																			L	
63	-							*																			L	
64	-							*																	640-645 NO FORAMS		L	
65	-		CLAY	5Y5/1		V.FIRM	MOIST	*																			L	
66	-							*																			L	
67	-							*																			L	
68	-							*																			L	
69	-							*																			L	
70	-							*																			L	
71	-							*																			L	
72	-							*																			L	
73	-								*																725-745 FORAMS COMMON		L	
74	-		SAND-CLAY	10YR4/1		V. FIRM	MOIST		*																A.beccarri, A.salsum,	13-30	L	
75	-		LAMS						*										*						E.clavatum, ostracods,		L	
76	-								*										*						and rangia		L	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

BORING NUMBER: BBL-12
QUADRANGLE: LAKE PENCHANT
LOCATION: BAYOU PENCHANT

DRIVE: 5.40m
LOSS:
SAMPLE LENGTH: 5.25m

DEPTH: cm	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10	ORGANICS	10YR2/2		LOOSE	WET		.5	M	
20	•	•		•	•		•	M	
30	•	•		•	•		•	M	
40	•	•		•	•		•	M	
50	•	•		•	•	46-56 1 A. INEPTA, 1 M.	•	M	
60	•	•		•	•	FUSCA, 7 TESTECIA	•	M	
70	•	•		•	•		•	M	
80	•	•		•	•		•	M	
90	CLAY	[illegible]		LOOSE	WET		•	NL	
100	•	•		•	•		•	NL	
110	•	•		•	•		•	NL	
120	•	5Y4/2	10YR5/6	FIRM	•		•	NL	
130	•	•	•	•	•		•	NL	
140	•	•	•	•	•		•	NL	
150	•	•		•	•		•	NL	
160	•	•		•	•	150-156 NO FORAMS	•	NL	
170	•	•		•	•		•	NL	
180	•	5Y3/2		•	•		•	NL	
190	•	•		•	•		•	NL	
200	•	•		•	•		•	NL	
210	•	•		•	•	200-206 NO FORAMS	•	NL	
220	SAND	5Y3/2		V. FIRM	MOIST		•	NL	
230	•	•		•	•		•	NL	
240	CLAY	5Y3/2		V. FIRM	MOIST		•	M	
250	•	•		•	•		•	M	
260	•	•		•	•	250-256 NO FORAMS	•	M	
270	•	•		•	•		•	M	
280	•	•		•	•	275-281 NO FORAMS	•	M	
290	PEAT			V. FIRM	WET		•	M	
300	CLAY	5Y2.5/1		V. FIRM	WET		•	M	
310	•	•		•	•		•	M	
320	PEAT			V. FIRM	WET	316-320 SPARSE FORAMS,	11-30	M	
330	•			•	•	T. INFLATA, T. MACRES-	•	M	
340	•			•	•	CENS, A. MEXICANA	•	M	
350	CLAY	5Y4/1		V. FIRM	WET		5-17	M	
360	•	•		•	•		•	M	
370	•	•		•	•		•	M	
380	•	•		•	•		•	M	
390	•	•		•	•		•	M	
400	•	•		•	•	390-396 NO FORAMS	•	M	
410	•	•		•	•		•	M	
420	•	•		•	•		•	M	PYRITIZED
430	•	•		•	•		•	M	ROOTS
440	•	•		•	•		•	M	•
450	•	•		•	•		•	M	•
460	•	•		•	•	450-456 SPARSE FORAMS,	•	M	•
470	•	•		•	•	T. INFLATA, T. MACRES-	•	M	•
480	•	•		•	•	CENS	•	M	•
490	PEAT			V. FIRM	WET	500 NO FORAMS	•	M	
500	•	•		•	•		•	M	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel SI = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=lag casts DT=distorted F=fractures IN=inclusions

PLATE A98

BORING NUMBER: PBL-29
QUADRANGLE: LAKE PENCHANT
LOCATION: SHELL RIDGE

DRIVE: 2.87m
LOSS:
SAMPLE LENGTH: 2.87m

DEPTH: cm	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	(M	P	L	LAMINATIONS W	C	R	] SF	(B	D	ORGANICS FD	W	) S	(SECONDARY BR	LC	DI	F	STRUCTURE) IB	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10 -		ORGANIC			LOOSE	V. WET																		0-5 NO FORAMS	.5	M	
20 -		•			•	•																			•	M	
30 -		•			•	•																			•	M	
40 -		•			•	•																			•	M	
50 -		•			•	•																			•	M	
60 -		CLAY	[illegible]		FIRM	V. WET	•										•								5	NL	
70 -		•	•		•	•	•										•								•	NL	
80 -		•	•		•	•	•										•								•	NL	
90 -		•	•		•	•	•										•								•	NL	
100 -		SILT	5Y3/1		FIRM	WET												•						104-107 NO FORAMS,	5	NL	[illegible]
110 -		•	•		•	•												•						ABUNDANT OSTRACODS	•	NL	
120 -		•	•		•	•												•						RANGIA	•	NL	
130 -		•	•		•	•												•								NL	
140 -		SILT CLAY	2.5Y2/0		V. FIRM	V. MOIST		•		•											•				[illegible]	NL	
150 -		•	•		•	•		•		•											•			150-155 NO FORAMS,COMMON	•	NL	
160 -		•	•		•	•		•		•											•			T. MACRESCENT,A.	•	NL	
170 -		•	•		•	•		•		•											•			WILBERTI,A. MEXICANUM	•	NL	
180 -		PEAT	2.5Y2/0		V. FIRM	V. MOIST	_										•							170-175 FORAMS COMMON,	[illegible]	M	
190 -		•	•		•	•											•							MOSTLY A. WILBERTI	•	M	
200 -		•	•		•	•											•								•	M	
210 -		CLAY(ORG)	5Y4/1		EXT. FIRM	V. MOIST	•										•						•		[illegible]	M	PYRITE
220 -		•	•		•	•	•										•						•		•	M	
230 -		•	•	2.5YR2.5/0	•	•	•										•						•		•	M	
240 -		•	•	•	•	•	•										•						•		•	M	
250 -		SILT	5Y5/1		EXT. FIRM	MOIST	•									•									.5	M	
260 -		•	•		•	•	•									•									•	M	
270 -		•	•		•	•	•									•									•	M	
280 -		•	•		•	•	•									•									•	M	
290 -		•	•		•	•	•									•								283-287 NO FORAMS	•	M	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IN,BS = Inland or Back Swamp CC = Crevasse Channel ST = Subst...
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SF=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DI=distorted F=fractures IN=inclus...

BORING NUMBER: SL-1
QUADRANGLE: LAKE PENCHANT
LOCATION: SHELL RIDGE

DRIVE: 2.75m
LOSS:
SAMPLE LENGTH: 2.61m

DEPTH: CM	LITHOLOGY	TEXTURE	COLOR	MOTTLES	CONSISTENCY	MOISTURE	[LAMINATIONS M	P	L	W	C	R	SC]	[ORGANICS B	D	FD	O	S]	(SECONDARY STRUCTURE) BR	LC	DT	F	IN	BIOSTRATIGRAPHY	SAL	DEPOSIT ENVIRON	REMARKS
10		ORGANICS		5Y4/6	LOOSE	V. WET											•									M	
20		•	•	•	•	•											•									M	
30		•	•	•	•	•											•									M	
40		•	•	•	•	•											•									M	
50		W/ SHELLS			LOOSE	V. WET												•								MI	
60		SHELL HASH		•	•	•												•								MI	
70		•		•	•	•												•								MI	
80		•		•	•	•												•								MI	
90		W/ SHELL		•	•	•												•								MI	
100		CLAY	[illegible]		V. FIRM	WET										•										M	
110		•	•		•	•										•										M	
120		•	•		•	•										•										M	
130		•	•	2.5YR	•	•										•										M	
140		•	•	2.5/0	•	•										•										M	
150		•	•	•	•	•										•										M	
155		SILT &	5Y4/1		V. FIRM	WET		•		•									•							M	
160		CLAY LAMS.	•		•	•		•		•									•				•			M	PYRITIZED
170		•	•		•	•		•		•									•							M	ROOTS
180		•	•		•	•		•		•									•							M	
190		•	•		•	•		•		•									•							M	
200		•	•		•	•		•		•									•							M	
210		PEAT	2.5YR		V. FIRM	WET											•									M	
220		•	2.5/0		•	•											•									M	
230		SILTY CLAY	5Y5/1		V. FIRM	WET	•																•			IB	CALCAREOUS
240		•	•		•	•	•																			IB	NODULES
250		•	•		•	•	•																			IB	
261		•	•		•	•	•																			IB	

DEPOSITIONAL ENVIRONMENT: M = Marsh NL = Natural Levee IB = Interdistributary Bay CF = Channel Fill LD = Lacustrine Delta MI = Midden S = Spoil IA,BS = Inland or Back Swamp CC = Crevasse Channel ST = Substratum
STRATIGRAPHY: M=massive P=parallel L=lenticular W=wavy C=cross R=ripple SC=scour & fill B=bedded D=distinct FD=finely divided S=shells BR=burrows LC=load casts DT=distorted F=fractures IN=inclusions

PLATE A100

APPENDIX B

RADIOCARBON DATA

BORING/ SAMPLE NUMBER	LAB ID NO.	MATERIAL	DEPTH (CM)	AGE (YEARS)	REMARKS
M-1-20	TX5203	PEAT	1190 TO 1208	5490 +/- 100	
M-1-20	TX5224	PEAT	1195 TO 1210	6210 +/- 120	
L-1-24	TX5204	SHELL HASH	1475 TO 1480	7480 +/- 190	
N-1-7/-8	TX5230	PEAT	415 TO 422	1450 +/- 70	
N-1-8	TX5228	WOOD	455 TO 462	2250 +/- 80	
N-1-17	TX5223	CLAY AND PEAT	1010 TO 1025	5300 +/- 100	
N-1-19	TX5229	WOOD	1125 TO 1130	6290 +/- 120	
C-11-1	TX5188	HEMIC PEAT	175 TO 187	1840 +/- 80	
MC-2-1	TX5193	FIBRIC PEAT	219 TO 234	1130 +/- 200	
MC-2-2	TX5194	HEMIC PEAT	239 TO 258	260 +/- 80	
MC-4-1	TX5195	HEMIC PEATY MUCK	149 TO 159	1590 +/- 110	
MC-5-1	TX5196	SAPRIC PEATY MUCK	150 TO 160		SAMPLE TOO SMALL- NOT DATED
MC-6	TX5179	SAPRIC PEATY MUCK	267 TO 285	1585 +/- 200	
G-3	TX5197	MUCKY CLAY	1054 TO 1068	3780 +/- 90	
G-3-22	TX5200	CLAY AND WOOD	1255 TO 1265	4460 +/- 140	
G-3-25	TX5201	PEAT	1463 TO 1476	5580 +/- 90	
G-4-6	TX5198	ORGANIC CLAY	413 TO 440	1620 +/- 70	
G-4-7	TX5199	MUCKY CLAY	473 TO 482	2370 +/- 150	
G-4-39	TX5226	WOOD	2570 TO 2585	8580 +/- 110	
G-5-1	TX5177	HEMIC PEAT	200 TO 265	2940 +/- 720	
G-5-2	TX5178	MUCKY CLAY	490 TO 530	3550 +/- 120	
G-6	TX5176	HEMIC PEATY MUCK	150 TO 171	2280 +/- 140	
G-6A-1	TX5189	SAPRIC PEAT	434 TO 450	1670 +/- 440	
LD-1-1	TX5191	HEMIC MUCK	75 TO 97	8190 +/- 880	QUESTIONABLE DATE- NOT USED
LD-1-2	TX5180	CLAY	216 TO 244	7400 +/- 1050	QUESTIONABLE DATE- NOT USED
LD-1-3	TX5182	SAPRIC PEAT	411 TO 427	3420 +/- 380	QUESTIONABLE DATE- NOT USED
LD-2	TX5182	MUCK	136 TO 150	3765 +/- 720	
LD-3	3.31-2	SAPRIC PEATY MUCK	392 TO 418	2250 +/- 225	
LD-4-1	TX5190	SILTY CLAY	269 TO 287	1090 +/- 125	
LD-7-1	TX5192	HEMIC MUCK	125 TO 137	8770 +/- 150	QUESTIONABLE DATE- NOT USED
LD11-1	TX5183	CLAYEY MUCK	68 TO 88	1080 +/- 90	
LD-11-2	3.38-9	SAPRIC MUCK	570 TO 588	3365 +/- 85	
SI-1-1	TX5187	HEMIC PEATY MUCK	198 TO 205	10060 +/-1200	QUESTIONABLE DATE- NOT USED
BDL-2-18	TX5225	PEAT	1040 TO 1055	4050 +/- 90	
BDL-2-18	TX5202	PEAT	1076 TO 1101	4660 +/- 80	

BORING/ SAMPLE NUMBER	LAB ID NO.	MATERIAL	DEPTH (CM)	AGE (YEARS)	REMARKS
BDL-2-49	TX5227	WOOD	2980 TO 2990	8530 +/- 140	
BDL-3-1	TX5184	PEAT	401 TO 424	2520 +/- 470	
BDL-3-2	TX5185	SAPRIC PEAT	502 TO 512	3840 +/- 150	
BDL-10-1	3.35-3	SAPRIC MUCK	224 TO 228	4215 +/- 390	
BDL-10-2	3.337-4	CLAY	126 TO 134	780 +/- 100	
BDL-10-3	3.32-1	SAPRIC MUCKY CLAY	236 TO 252	4505 +/- 550	
BDL-11-1	3.30-2	FIBRIC PEAT	152 TO 162	1315 +/- 225	
BDL-11-2	3.29-3	HEMIC PEATY MUCK	371 TO 390	3055 +/- 145	
BDL-12-1	TX5174	SAPRIC PEAT	354 TO 373	2115 +/- 135	
BDL-12-2	TX5175	SAPRIC PEAT	480 TO 500	3510 +/- 120	
BDL-20-1	TX5186	CLAYEY MUCK	188 TO 205	2890 +/- 760	
V4	TX5219	HEMIC CLAYEY MUCK	207 TO 223	2430 +/- 80	REMAINING RADIOCARBON DATE LOCATIONS ARE FROM KEARNS (1985) AND ARE NOT PLOTTED ON THE WES GEOMORPHIC MAPS (SAMPLES V4 THROUGH VR75).
V6	TX5206	SAPRIC PEATY MUCK	720 TO 737	4570 +/- 90	
V18	TX5215	SAPRIC PEATY MUCK	712 TO 727	3340 +/- 90	
VR3-A	TX5209	HEMIC PEATY MUCK	139 TO 149	2360 +/- 80	
VR3-B	TX5210	SAPRIC PEAT	292 TO 302	510 +/- 70	
VR3-C	TX5211	SAPRIC PEAT	397 TO 407	2870 +/- 90	
VR3-D	TX5212	SAPRIC PEATY MUCK	832 TO 842	5090 +/- 110	
VR5-A	TX5218	SAPRIC PEAT	335 TO 350	3380 +/- 90	
VR5-B	TX5216	SAPRIC MUCKY CLAY	491 TO 497	3730 +/- 90	
VR9-A	TX5213	HEMIC MUCK	505 TO 520	3520 +/- 80	
VR9-B	TX5214	SAPRIC MUCK	590 TO 605	3480 +/- 60	
VR20	TX5217	HEMIC PEAT	245 TO 259	2730 +/- 60	
VR22	TX5207	SAPRIC PEAT	725 TO 740	5590 +/- 100	
VR48	TX5205	HEMIC PEAT	165 TO 175	2040 +/- 60	
VR75	TX5208	HEMIC PEAT	169 TO 182	1400 +/- 80	

EXPLANATION OF AGE DETERMINATION TERMS

Conventional radiocarbon date

B1. Conventional radiocarbon date is age 8033ln (counts per minute of the oxalic acid - counts per minute of the background times 0.7459 (1-(17.8 + del ^{13}C/1000)/counts per minute of the sample, counts per minute of the background times (1-2(25 + del ^{13}C/1000).
This term also implies:

a. the use of the 5568 year half-life (mean life 8033).
b. the assumption of constancy of ^{14}C atmospheric level during the past.
c. the use of oxalic acid (direct or indirect) as a standard.
d. isotopic fractionation normalization of all sample activities to the base of del ^{13}C = -25 per mil (relative to the $^{13}C/^{12}C$ ratio of the PeeDee Belemnite).
e. the year 1950 is automatically the base year, with ages given in years BP (i.e., present is 1950 AD).

Counting time

B2. All samples are counted for at least 24 hours. Samples that are less than 1 gram, less than 1000 years BP, or greater than 25,000 years BP are counted for at least 48 hours to reduce the error factor on the age.

Error factor

B3. Error factor is based on the size of the sample and the number of accumulated counts of the sample, oxalic acid, and background. The statistical uncertainty of the age determination is reported as +/- one standard deviation.

Raw age

B4. Raw age does not take into consideration the del ^{13}C value of the sample. The equation is age = 8033ln (counts per minute of the oxalic acid, counts per minute of the background/counts per minute of the sample, counts per minute of the background).

Sample size

B5. Samples that are less than 1 gram are counted for extended counting times to increase the reliability of the age and reduce the error factor.

Standard pretreatment

B6. Once the size fraction to be dated has been isolated, the following steps are followed:

a. Sample is boiled for 30 min in 500 ml of 0.2N HCl.
b. Sample is rinsed repeatedly in deionized distilled water till the pH is neutral.
c. Sample is boiled for 30 min in 500 ml of 0.2N NaOH.
d. Sample is rinsed repeatedly in deionized distilled water till the water is clear.
e. Sample is decanted and dried overnight at 75°C.
f. Sample is crushed with a mortar and pestle, weighed, and stored in an air tight container.

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5203 **Date Received:** 12/08/84

Your Reference: M-1 #20 **Date Reported:** 02/08/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Peat

AGE = 5490 +/- 100 years BP

Description: Peat collected at -1190 to -1208 cm in the Maringouin Quadrangle. Sample overlain by gray clay and underlain by peat.

Pretreatment: Standard pretreatment.

Comment: Sample (2.6242 g C_6H_6) counted for 2,000 min.

δC^{13}_{PDB} = ‰ Not requested, therefore, mean value of -27‰ used for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S oxalic acid (RM-4900-C).

PLATE B4

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY
RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5224 **Date Received:** 12/21/84

Your Reference: M-1 #20 **Date Reported:** 02/22/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Peat

AGE = 6210 +/- 120

Description: Peat collected at -1195 to -1210 and is overlain by gray clay. Sample collected in the Maringouin Quadrangle

Pretreatment: Standard Pretreatment

Comment: Sample weighed 2.6242 g and was counted for 2,000 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Suitver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B5

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION   REPORT OF ANALYTICAL WORK

Our Sample No. TX 5204 **Date Received:** 12/21/84

Your Reference: L-1-24 **Date Reported:** 02/14/85

Submitted by: Lawson Smith
US Armv Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Shell hash

AGE = 7480 +/- 190

Description: Shell hash and clay collected at -1475 to 1980 cm at Loreauville WABPL.

Pretreatment: Standard Pretreatment.

Comment: Sample (1.0911) counted for extended time (3,700 min.) to reduce the error factor. Age correction error on table DEL C^{13}.

Value is 410 +/- 70

δC^{13}_{PDB} = % Not requested, therefore, mean value of -0% for marine shells used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S oxalic acid (RM-4990-C).

PLATE B6

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

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(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5230 **Date Received:** 12/14/84

Your Reference: N-1 #7 & #8 **Date Reported:** 02/14/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Peat

AGE = 1450 +/- 70

Description: Peat collected at -415 to -422. Sample location is north of Morgan City on toe of levee near Napoleonville, La.

Pretreatment: Standard Pretreatment.

Comment: Sample weight is 2.6142 g and was counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of 27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S oxalic acid (RM-4990-C).

PLATE B7

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

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(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5228 **Date Received:** 12/21/84

Your Reference: N-1 #8 **Date Reported:** 02/14/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Wood

AGE = 2250 +/- 80

Description: Wood collected at -455 to -462 cm at Napoleonville, La., north of Morgan City on toe of levee.

Pretreatment: Standard Pretreatment.

Comment: Sample weighed 2.6201 g and was counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -25‰ for recent wood used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B8

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5223 **Date Received:** 12/21/84

Your Reference: N-1 #17 **Date Reported:** 02/14/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Clay and peat.

AGE = 5300 +/- 100

Description: Clay and peat collected at -1010 to 1025 cm at E.A.B.P.L. between sta 1850 to 1900.

Pretreatment: Standard Pretreatment.

Comment: Sample weighed 2.6154 g and was counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S oxalic acid (RM-4990-C).

PLATE B9

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

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(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5229 **Date Received:** 12/21/84

Your Reference: N-1 #19 **Date Reported:** 02/14/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Wood

AGE = 6290 +/- 120

Description: Wood collected at -1125 to -1130 cm at Napoleonville, La., north of Morgan City on toe of levee

Pretreatment: Standard Pretreatment.

Comment: Sample weighed 2.6201 g and was counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -25% for wood used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B10

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

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(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5188 **Date Received:** 11/19/84

Your Reference: C-II-1 **Date Reported:** 01/24/84

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic dark brown peat (clay)

AGE = 1840 +/- 80 years BP

Description: Hemic dark brown peat (clay) collected at -175 to -187 cm depth on Cyprus Island.

Pretreatment: Modern rootlets removed and then standard pretreatment followed.

Comment: Sample (1.9062 g) counted for extended counting time (3,000 min.) due to a power failure. Extended time was necessary to verify the reproducibility of the results.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B11

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5193 **Date Received:** 11/19/84

Your Reference: MC-2-1 **Date Reported:** 02/08/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Fibric Peat (Silty Clay)

AGE = 1130 +/- 200 years BP

Description: Red to black fibric peat (silty clay) with iron coatings collected at -219 to -234 cm along the flanks of Piquant Bayou. Sample over-layed and underlayed by peat.

Pretreatment: Standard pretreatment followed by removal of charcoal from sample.

Comment: Sample (.4414 g C_6H_6) counted for extended time (5,300 min.) to reduce the error.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B12

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5194 **Date Received:** 11/19/84

Your Reference: MC-2-2 **Date Reported:** 02/08/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WESGR

Sample Name: Hemic Peat (clay)

AGE: [illegible] +/- 80 [illegible]

Description: Hemic peat (clay) collected at -239 to -258 cm along Piquant Bayou. Sample overlain by alternating thin layers of peat and gray clay.

Pretreatment: Standard pretreatment followed by removal of small quantities of modern rootlets.

Comment: Sample (1.1226 g C_6H_6) counted for an extended time (4,800 min.) due to the young age.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4900-C).

PLATE B13

LOUISIANA GEOLOGICAL SURVEY

RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5195 **Date Received:** 11/19/84

Your Reference: MC-4-1 **Date Reported:** 02/08/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Peaty Muck (clay)

AGE= 1590 +/- 110 years BP

Description: Hemic peaty muck (clay) collected at -149 to -159 cm along Bayou Penchant natural levee. Sample overlayed and underlayed by dark gray clay with organics.

Pretreatment: Standard pretreatment followed by removal of modern rootlets and charcoal.

Comment: Sample (.9745 g C_6H_6) counted for extended time (2,700 min.) to reduce the error.

δC^{13}_{PDB} = **%** Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4900-C).

PLATE B14

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-8827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5196 **Date Received:** 11/19/84

Your Reference: MC-5-1 **Date Reported:** 02/08/85

Submitted by: Lawson Smith
US Armv Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peaty Muck (clay)

AGE = SAMPLE TOO SMALL

Description: Black sapric peaty muck (clay) collected at -150 to -160 cm along Bayou Chene natural levee. Sample overlaved and underlayed by organic clay.

Pretreatment: Standard pretreatment followed by the removal of modern rootlets. A majority of the sample was modern rootlets.

Comment: Sample was chemically processed to benszene but was too small to count.

δC^{13}_{PDB} = %

PLATE B15

LOUISIANA GEOLOGICAL SURVEY

RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5179 **Date Received:** 11/09/84

Your Reference: MC-6 **Date Reported:** 01/14/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peaty Muck with mucky clay interlayers

AGE = 1585 +/- 200 years BP

Description: Sapric peaty muck with mucky clay interlayers collected at -267 to -285 cm along the flanks of Bayou Traine natural levee. Sample also had wood chips dispersed throughout.

Pretreatment: Wood chips and modern rootlets removed. Standard pretreatment was then followed.

Comment: Sample (.4902 g C_6H_6) counted for an extended time (2,600 min.) to minimize error.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B16

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION   REPORT OF ANALYTICAL WORK

Our Sample No. TX 5197   **Date Received:** 12/21/84

Your Reference: G-3   **Date Reported:** 02/22/85

Submitted by: Lawson Smith
US Armv Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Mucky Clay.

AGE = 3780 +/- 90

Description: Mucky clay collected from -1054 to -1068 cm along Little Bayou Black natural levee.

Pretreatment: Standard Pretreatment.

Comment: Sample (1.6717 g) counted for 3,000 min.

δC^{13}_{PDB} - % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B17

LOUISIANA GEOLOGICAL SURVEY

RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5200

Date Received: 12/21/84

Your Reference: G-3 #22

Date Reported: 02/22/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Clay and wood.

AGE = 4460 +/- 140

Description: Wood and clay collected from -1255 to 1265 cm along the natural levee of Bayou Black near Houma, La.

Pretreatment: Standard Pretreatment

Comment: Sample (1.0896) counted for 2,800 min. to reduce the error.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -25% for recent wood used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B18

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5201 **Date Received:** 12/21/84

Your Reference: G-3 #25 **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Peat (Clay)

AGE = 5580 +/- 90 years BP

Description: Peat (clay) collected at -1463 to -1476 cm along the natural levee of Little Bayou Black.

Pretreatment: Standard Pretreatment.

Comment: Sample (2.6167 g C_6H_6) counted for 2,800 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B19

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5198 **Date Received:** 12/21/84

Your Reference: G-4 #6 **Date Reported:** 02/22/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Organic clay

AGE = 1620 +/- 70

Description: Peat collected from -413 to -440 cm along the natural levee flanks of Little Bayou Black.

Pretreatment: Standard Pretreatment.

Comment: Sample (2.6123) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B20

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5199 **Date Received:** 12/21/84

Your Reference: G-4-7 **Date Reported:** 02/22/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WECTR

Sample Name: Mucky clay.

AGE = 2370 +/- 150

Description: Mucky clay collected from -473 to -482 cm along the natural levee flanks of Little Bayou Black.

Pretreatment: Standard pretreatment.

Comment: Sample (.9192 g) counted for 2,800 min. to reduce the error.

δC^{13}_{PDB} ‰ Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B21

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY
RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5226 **Date Received:** 12/21/84

Your Reference: G-4 #39 **Date Reported:** 02/14/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Wood

AGE = 8580 +/- 110

Description: Wood in clay collected at -2570 to -2585 cm near Houma, La. on Little Bayou Black.

Pretreatment: Standard Pretreatment.

Comment: Sample weighed 2.3989 g and was counted for 2,800 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -25% for recent wood used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B22

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5177 **Date Received:** 11/09/84

Your Reference: G-5-1 **Date Reported:** 01/04/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic peat

AGE = 2940 +/- 720 years BP

Description: Hemic peat from the base of the natural levee flanking Bayou Cocodrie Sample collected from 200 to 265 cm.

Pretreatment: Standard pretreatment as described previously.

Comment: Exceeding small sample (.166 g C_6H_6) counted for extended counting time (3,700 min.).

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B23

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5178 **Date Received:** 11/09/84

Your Reference: G-5-2 **Date Reported:** 01/07/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Mucky clay

AGE: 3550 +/- 120

Description: Sample collected at the base of a uniform clay sequence along the levee flank of Bayou Cocodrie. Sample collected from 490 to 530 cm.

Pretreatment: Standard Pretreatment

Comment: Sample weight is 1.260g C_6H_6 counted for 2,000 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: The date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B24

LOUISIANA GEOLOGICAL SURVEY

RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5176 **Date Received:** 11/09/84

Your Reference: G-6 **Date Reported:** 01/04/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Peaty Muck

AGE = 2280 +/- 140 years BP

Description: Peaty muck from natural levee deposits of Bayou Cocodrie. Sample collected from 150 - 171 cm.

Pretreatment: Seed pods and modern rootlets removed. Standard Pretreatment was then followed.

Comment: Sample counting time (2,400 min.) extended to accommodate small sample size (.8825 of C_6H_6)

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B25

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5189 **Date Received:** 11/19/84

Your Reference: G-6A-1 **Date Reported:** 01/24/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peat (Clay)

AGE = 1670 +/- 440 years BP

Description: Red-brown to black sapric peat (clay) collected at -434 to -450 cm along the natural levee flanks of Bayou Cocodrie.

Pretreatment: Standard pretreatment followed.

Comment: Sample (.1890 g C_6H_6) counted for extended time (3,900 min.) to reduce the error factor.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. cxalic acid (RM-4990-C).

PLATE B26

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5191 **Date Received:** 11/09/84

Your Reference: LD-1-1 **Date Reported:** 02/08/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Muck (clay)

AGE = 8190 +/- 880

Description: Hemic muck (clay) collected at -75 to -97 cm along the natural levee flanks of Rice Bayou. Sample over and underlain by slightly organic clay.

Pretreatment: Standard pretreatment followed by the removal of modern organics.

Comment: Sample (.2500 g C_6H_6) counted for an extended time (4,100 min.) to reduce the error. For additional comments see TX 5192, LD-7-1.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4900-C).

PLATE B27

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY
RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5180 **Date Received:** 11/09/84

Your Reference: LD-1-2 **Date Reported:** 01/14/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Clay, fine sand, mucky clay, and muck interlayered

AGE = 7400 +/- 1050 years BP

Description: Clay, fine sand, mucky clay, and muck interlayered collected at -216 to -244 cm along the flanks of Rice Bayou natural levee. Small (1-4 mm) wood chips distributed throughout samples.

Pretreatment: Wood chips and obvious detrital material removed and then standard pretreatment followed.

Comment: Date is probably not on in situ organics and is therefore not reliable. LD-1-3 (411-427 cm, 3420 +/- 380 years BP) also supports this contention. Sample (0.1762 g C_6H_6) counted for extended time (5,400 min.) to minimize error.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B28

LOUISIANA GEOLOGICAL SURVEY

RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5182 **Date Received:** 11/09/84

Your Reference: LD-1-3 **Date Reported:** 01/14/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric peat with wood and clay interbeds

AGE = 3420 +/- 380 years BP

Description: Sapric peat with wood collected along the natural levee flanks of Rice Bayou at -411 to -427 cm.

Pretreatment: Wood removed and then standard pretreatment followed.

Comment: Sample (.2720 g C_6H_6) counted for extended counting time (4,100 min.) to reduce the error factor. Material dated appears to be in situ.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B29

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5181 **Date Received:** 11/09/84

Your Reference: LD-2 **Date Reported:** 01/16/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Muck (silty clay)

AGE = 3765 +/- 720 years BP

Description: Muck (silty clay) collected at -136 to -150 cm depth along the natural levee flanks of Carrion Crow Bayou.

Pretreatment: Modern rootlets removed before standard pretreatment procedures followed.

Comment: Sample (.1989 g C_6H_6) counted for extended time (2,700 min.) to reduce the error factor.

δC^{13}_{PDB} = Not requested, therefore, mean value of -27% for peats and humus % used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B30

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. 3.31-2 **Date Received:** 10/15/84

Your Reference: LD-3 **Date Reported:** 11/16/84

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peaty Muck (Clay)

AGE = 2250 +/- 225 years BP

Description: Sample collected from a vibracore along the flank of Bayou Carencro. Sample collected from -392 to 418 cm and was overlayed by ~80 cm of slightly organic blue-grey clay and underlayed by ~120 cm of grey silty clay.

Pretreatment: Majority of inorganic material separated from organic sample by decanting procedures. All organic size fractions retained for radiocarbon assay. Numerous seed pods removed from sample before standard pretreatment.

Comment: Small sample size compensated for by extended counting time (2,880 min.)

δC^{13}_{PDB} = Not requested therefore mean value of -27‰ for peats and humus used in age calculation. ‰

Note: This date is a "conventional radiocarbon date" as defined by Stuiver and Pollack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B31

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5190 **Date Received:** 11/19/84

Your Reference: LD-4-1 **Date Reported:** 01/24/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Levee silty clay with some sand pockets interlayered with rooted mucky clay lenses

AGE* 1090 +/- 125 years BP

Description: Levee silty clay with some sand pockets and lenses of mucky clay collected from -269 to -287 cm along Carrion Crow Bayou.

Pretreatment: Modern rootlets removed before standard pretreatment procedures followed.

Comment: Sample ([illegible] g C_6H_6) counted for extended counting time (2,700 min.) to reduce the error factor.

δC^{13}_{PDB} ‰ Not requested, therefore, mean value of -27‰ for peats and humus used in the calculation.

Note: *This date is a "conventional radiocarbon age" as defined by Stuiver and Polach (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4900-C).

PLATE B3[illegible]

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5192 **Date Received:** 11/19/84

Your Reference: LD-7-1 **Date Reported:** 02/08/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 31
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Muck (clay)

AGE = 8770 +/- 150 years BP

Description: Hemic Muck (clay) collected at -125 to -137 cm along the flanks of Rice Bayou natural levee. Sample overlayed and underlayed by gray clay with organics.

Pretreatment: Standard pretreatment followed by removal of modern organics.

Comment: Sample (.2301 g C_6H_6) counted for extended counting time (2,700 min.) to reduce the error. Apparently older detrital material was incorporated in the sample and not removed during the pretreatment. Note the ages of other samples in the Rice Bayou area: LD-1-3 (-411 to -427) 3420 +/- 380, LD-1-2 (-216 to -244) 7400 +/- 1050 and LD-1-1 (-75 to -97) 8170 +/- 880. LD-7-1, LD-1-2, and LD-1-1 probably represent detrital material brought in during fland times. I would suggest using the age LD-1-3 for this level in the Rice Bayou Area.

δC^{13}_{PDB} ‰ Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4900-C).

PLATE B33

LOUISIANA GEOLOGICAL SURVEY

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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5183 **Date Received:** 11/09/84

Your Reference: LD-11-1 **Date Reported:** 01/25/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WESGR

Sample Name: Clayey Muck

AGE = 1080 +/- 90 years BP

Description: Clayey Muck collected at -68 to -88 cm along the natural levee flanks of Bayou Derude. Sample overlayed by grey clay and underlayed by alternating clay and sand lenses.

Pretreatment: Modern rootlets removed followed by standard pretreatment.

Comment: Sample (1.1184 g C_6H_6) counted for extended counting time (3,000 min.) due to the young age.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B34

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. 3.38-9 **Date Received:** 11/09/84

Your Reference: LD-11-2 (570-588) **Date Reported:** 11/16/84

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Muck (Clay)

AGE = 3365 +/- 85 years BP

Description: Muck (clay) collected at -570 to -588 cm in the Terrebonne Marsh along Bayou Decade. Sample overlayed by 100 cm of grey clay and underlayed by peat.

Pretreatment: Modern material removed from the side wall of vibracore sample before decanting. Standard pretreatment was then followed.

Comment: Sample was a full volume sample (2.637 of C_6H_6) counted for 2585.05 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon date" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B35

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5187 **Date Received:** 11/19/84

Your Reference: SI-1-1 **Date Reported:** 02/04/84

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Peaty Muck (Clay)

AGE= 10,060 +/- 1200 years BP

Description: Hemic peaty muck (clay) collected at -198 to -205 cm along the Lake Penchant trend. Sample overlayed and underlayed by dark gray clay with organics.

Pretreatment: Standard pretreatment.

Comment: Sample (.2503 g C_6H_6) counted for extended counting time (3,000 min.) to reduce the error factor. Age seems anomalously high for this depth in the Lake Penchant trend. Apparently, older detrital material was incorporated in the sample and not removed during the pretreatment. I would recommend that the age of BDL-20-1 be used for the Lake Penchant trend. You will note that the stratigraphic information for SI-1-1 and BDL-20-1 is similar at the depth.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B36

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5202 **Date Received:** 12/21/84

Your Reference: BDL-2 #18 **Date Reported:** 02/14/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Peat (clay)

AGE = 4660 +/- 80

Description: Peat collected at -1076 to -1101 at the intersection of Bayou Du Large and Small Bayou La Pointe. Sample overlayed and underlayed by stratified organic clay and peat.

Pretreatment: Standard Pretreatment

Comment: Sample weight is 2.6236 g and was counted for 2.600 min.

δC^{13}_{PDB} = Not requested, therefore, mean value of -27% for peats and humus used in age calculation. %

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S oxalic acid (RM-4990-C).

PLATE B37

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5225 **Date Received:** 12/21/84

Your Reference: BDL-2 #18 **Date Reported:** 02/22/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Peat

AGE = 4050 +/- 90

Description: Peat collected at -1040 to -1055 cm at the intersection of Bayou Du Large and Small Bayou La Pointe.

Pretreatment: Standard Pretreatment.

Comment: Sample weighed 2.6170 g and was counted for 1,800 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B38

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5227 **Date Received:** 12/18/84

Your Reference: BDL-2 #49 **Date Reported:** 02/08/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Wood

AGE = 8530 +/- 140 years BP

Description: Wood collected at -2980 to -2990 cm at the intersection of Bayou Du Large and Bayou La Pointe.

Pretreatment: Standard pretreatment.

Comment: Sample (2.6098 g C_6H_6) counted for 1,700 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -25% for recent wood used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B39

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5184 **Date Received:** 11/19/84

Your Reference: BDL-3-I **Date Reported:** 01/16/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Peat (silty clay)

AGE = 2520 +/- 470 years BP

Description: Peat (silty clay) collected at -401 to -424 cm along the levee flank of Marmande Ridge.

Pretreatment: Charcoal and one small wood chip (2 mm) removed before standard pretreatment followed.

Comment: Sample (.220 g C_6H_6) counted for extended counting time (2,700 min.) to reduce the error factor.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B40

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5185 **Date Received:** 11/19/84

Your Reference: BDL-3-2 **Date Reported:** 01/24/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Black sapric peat (clay)

AGE = 3840 +/- 150 years BP

Description: Black sapric peat (clay) collected at -502 to -512 cm along the natural levee flank of Marmande Ridge. Sample had fusinite and organic remains replaced by FeO_2. Sample overlayed and underlayed by peat.

Pretreatment: Standard pretreatment.

Comment: Sample size was 1.0782 grams counted for 2,700 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B41

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. 3.35-3 **Date Received:** 10/15/84

Your Reference: BDL-10-1 (224-228) **Date Reported:** 11/16/84

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Muck (Clay)

AGE = 4215 +/- 390 years BP

Description: Sample collected at -224 to -228 cm from a vibracore in the Terrebonne Marsh. Sediment above and below sample was a uniform grey clay.

Pretreatment: Decantation procedures followed to remove inorganic fractions. Fibric rootlets and seed pods removed before standard pretreatment measures.

Comment: Extended counting time not employed since sample size was marginal. Results compare favorably with 3.32-1.

δC^{13}_{PDB} = ‰ Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon date" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B42

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION   REPORT OF ANALYTICAL WORK

Our Sample No. 3.37-4   **Date Received:** 10/15/84

Your Reference: BDL-10-2 (126-134 cm)   **Date Reported:** 11/16/84

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Clay

AGE = 780 +/- 100 years BP

Description: Clay containing approximately 4% organic matter collected at -126 to -134 cm depth from a vibracore in the Terrebonne Marsh.

Pretreatment: Decantation to remove a majority of the inroganic material followed by mechanical removal of fibric organics. Sample was then submitted to standard pretreatment.

Comment: Counting time extended to 4,320 min. due to age and size of sample.

δC^{13}_{PDB} = Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation. ‰

Note: This date is a "conventional radiocarbon date" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B43

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. 3.32-1 **Date Received:** 10/15/84

Your Reference: BDL-10-3 (236-252 cm) **Date Reported:** 11/16/84

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Mucky Clay

AGE = 4505 +/- 550 years BP

Description: Sample collected from vibracore in Terrebonne Marsh. Sample interval is 236-252 cm. Sediment above and below the sample is a highly organic black clay. Organic content of sample is approximately 6%.

Pretreatment: Decantation procedures to remove silt size inorganics followed by standard pretreatment.

Comment: Sample counted for 4,320 min. to reduce the error and increase the reliability of the date. Sample BDL-10-1 (224-228) dated at 4215 +/- 390 which suggests that the date (3.32-1) is reliable.

δC^{13}_{PDB} = ‰ Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon date" as defined by Stuiver and Pollack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B44

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. 3.30-2 **Date Received:** 10/15/84

Your Reference: BDL-11-1 (152-162 cm) **Date Reported:** 11/16/84

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Fibric Peat (Clay)

AGE = 1315 +/- 225 years BP

Description: Sample collected along the flank of Bayou Copasaw, Terrebonne Marsh. Sample collected from -152 to -162 cm. Description of a portion of the vibracore is as follows: 1) "0-95 cm modern fresh marsh, 2) 95-152 blue-grey clay and 3) 152-210 several peat layers separated by thin (1-3 cm) clay layers."

Pretreatment: Sample was wet sieved through Nos. 10, 30, 60, 100, 200, 325, and 400 screens to remove a majority of the modern rootlets. Material on 325 and 420 screens retained for further treatment. Sample was then examined under the microscope to ensure all modern rootlets had been removed. Standard pretreatment procedures were then followed.

Comment: Majority of this peat sample was modern rootlets and had to be removed. Therefore extended counting time (4,320 min.) was allowed to improve the error and reliability of the date.

δC^{13}_{PDB} = ‰ Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon date" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B45

LOUISIANA GEOLOGICAL SURVEY
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RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. 3.29-3 **Date Received:** 10/15/84

Your Reference: BDL-11-2 (371-390 cm) **Date Reported:** 11/16/84

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Peaty Muck (Silty Clay)

AGE = 3055 +/- 145 years BP

Description: Sample collected along the flank of Bayou Copasaw, Terrebone marsh, overlayed from -162 to -350 cm by "slightly organic blue-gray clay". Sample collected from -371 -390 cm in a zone of peat seams separated by blue-gray clay.

Pretreatment: Majority of inorganic material was separated from sample by decantation procedures. All organic size fractions were retained due to small sample size. Seed pods and several insect curapaces were removed before standard pretreatment procedures were followed.

Comment: The sample counted for an extended counting time (4,169.5 min.) in order to reduce the error and improve the reliability of date.

δC^{13}_{PDB} = ‰ Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon date" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B46

LOUISIANA GEOLOGICAL SURVEY
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(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5174 **Date Received:** 11/09/84

Your Reference: BDL-12-1 **Date Reported:** 01/04/[illegible]

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WESGR

Sample Name: Sapric Peat with mucky clay interlayers

AGE = 2115 +/- 135 years BP

Description: Sapric peat collected at -354 to -373 cm along the natural levee flanks of Bayou Penchant

Pretreatment: Standard Pretreatment

Comment: Sample (.814g C_6H_6) counted for extended time (2,400 min.) to minimize the error.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27 for peats and humus used in age calculation.

Note: The date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B47

LOUISIANA GEOLOGICAL SURVEY
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(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. BDL-12-2 **Date Received:** 11/09/84

Your Reference: TX 5175 **Date Reported:** 01/07/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peat

AGE = 3510 +/- 120

Description: Sapric peat collected at -480 to 500 cm along the natural levee flanks of Bayou Penchant.

Pretreatment: Standard pretreatment plus modern material removed from the side-walls of the core.

Comment: Sample (.9393g C_6H_6) counted for extended time (4,800 min.) to minimize the error factor.

δC^{13}_{PDB} = Not requested, therefore, mean value of -27‰ for peats and humus ‰ used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B48

LOUISIANA GEOLOGICAL SURVEY
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RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5186 **Date Received:** 11/19/84

Your Reference: BDL-20-1 **Date Reported:** 01/24/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Greenish dark gray clayey muck

AGE = 2890 +/- 760 years BP

Description: Greenish dark gray clayey muck collected at -188 to -205 cm along the Lake Penchant trend.

Pretreatment: Vertical fibric rootlets removed and then standard procedures were followed.

Comment: Sample (.1500 g C_6H_6) counted for extended counting time (3,800 min.) to reduce the error factor.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B49

KEARNS (1985) RADIOCARBON SAMPLES

PLATE B50

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5219 **Date Received:** 12/21/84

Your Reference: V 4 **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WESGR

Sample Name: Hemic Clayey Muck

AGE = 2430 +/- 80 years BP

Description: Hemic clayey muck collected from Sale-Teche-Cypremort interdistributary basin at a depth of -207 to -223 cm in a well drained swamp (possible Teche levee) environment.

Pretreatment: Modern rootlets removed and then standard pretreatment followed.

Comment: Sample (1.7416 g C_6H_6) counted for 2,600 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B51

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5206 **Date Received:** 12/21/84

Your Reference: V 6 **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peaty Muck (clay)

AGE= 4570 +/- 90

Description: Sapric peaty muck (clay collected from the Sale-Teche-Cypremort interdistributary basin at a depth of -720 to -737 cm in a natural levee environment.

Pretreatment: Standard pretreatment.

Comment: Sample (2.6123 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B52

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION   REPORT OF ANALYTICAL WORK

Our Sample No. TX 5215 **Date Received:** 12/21/84

Your Reference: V 18 **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peaty Muck (clay)

AGE = 3340 +/- 90 years BP

Description: Sapric peaty muck (clay) collected from the Sale-Teche-Cypremort interdistributary basin at a depth of -712 to -727 cm in a channel fill environment.

Pretreatment: Standard pretreatment

Comment: Sample (2.6174 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used for age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990 C).

PLATE B53

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY
RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5209 **Date Received:** 12/21/84

Your Reference: VR 3 (2) **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Peaty Muck (clay)

AGE = 2360 +/- 80 years BP

Description: Hemic peaty muck (clay) collected from the Sale-Teche-Cypremort inter-distributary basin at a depth of -139 to -149 cm in a fresh marsh environment.

Pretreatment: Modern rootlets removed and then standard pretreatment followed.

Comment: Sample (2.2027 g C_6H_6) counted for 2,600 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B54

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5210 **Date Received:** 12/21/84

Your Reference: VR 3 (b) **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peat (clay)

AGE = 510 +/- 70

Description: Sapric peat (clay) collected from the Sale-Teche-Cyrpemort inter-distributary basin at a depth of -292 to -302 cm in an intermediate brackish marsh.

Pretreatment: Standard pretreatment

Comment: Sample (2.6192 g C_6H_6) counted for 1,400 min. Age is obviously anomalous. Sample was contaminated with modern material during collection, storage, and/or pretreatment. No obvious signs of contamination noted.

δC^{13}_{PDB} = Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation. %

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B55

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION   REPORT OF ANALYTICAL WORK

Our Sample No. TX 5211   **Date Received:** 12/21/84

Your Reference: VR 3 (c)   **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric peat (clay)

AGE = 2870 +/- 90 years BP

Description: Sapric peat (clay) collected from the Sale-Teche-Cypremort interdistributary basin at a depth of -397 to -407 cm in an intermediate to brackish marsh.

Pretreatment: Standard pretreatment.

Comment: Sample (2.6254 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B56

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5212 **Date Received:** 12/21/84

Your Reference: VR 3 (d) **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peaty Muck (clay)

AGE = 5090 +/- 110 years BP

Description: Sapric peaty muck (clay) collected from the Sale-Teche-Cypremort inter-distributary basin at a depth of -832 to -842 in a poorly drained swamp.

Pretreatment: Standard Pretreatment

Comment: Sample (2.1263 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B57

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5218 **Date Received:** 12/21/84

Your Reference: VR 5 (a) **Date Reported:** 03/15/85

Submitted by: Lawson Smit:
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Peat (clay)

AGE = 3380 +/- 90 years BP

Description: Sapric peat (clay) collected form the Sale-Teche-Cypremort interdistributary basin at a depth of -335 to -350 cm in a fresh marsh environment.

Pretreatment: Standard Pretreatment.

Comment: Sample (2.6084 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B58

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

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(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5216 **Date Received:** 12/21/84

Your Reference: VR 5 (6) **Date Reported:** 03/15/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station: WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Mucky Clay

AGE = 3730 +/- 90 years BP

Description: Sapric Mucky Clay collected from the Sale-Teche-Cypremort interdistributary basin at a depth of -491 to -497 cm in a fresh marsh environment.

Pretreatment: Standard Pretreatment.

Comment: Sample (2.3300 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B59

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

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(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5213 **Date Received:** 12/21/84

Your Reference: VR 9 (a) **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Muck (clay)

AGE = 3520 +/- 80

Description: Hemic muck (clay) collected from the Sale-Teche-Cypremort interdistributary basin at a depth of -505 to -520 cm in a poorly drained swamp environment.

Pretreatment: Standard pretreatment.

Comment: Sample (2.6081 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation. %

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B60

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY
RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5214 **Date Received:** 12/21/84

Your Reference: VR 9 (6) **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Sapric Muck (clay)

AGE = 3480 +/- 60

Description: Sapric Muck (clay) collected from the Sale-Teche-Cypremort basin at a depth of -590 to -605 cm in an intermediate to brackish marsh environment.

Pretreatment: Standard pretreatment.

Comment: Sample (2.6158 g C_6H_6) counted for 3,900 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B61

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5217 **Date Received:** 12/21 8[illegible]

Your Reference: VR 20 **Date Reported:** 03/15/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Peat (Silty Clay)

AGE 2730 +/- 60 years BP

Description: Hemic peat (silty clay) collected from the Sale-Teche-Cypremort interdistributary basin at a depth of -245 to -259 cm in a poorly drained swamp environment.

Pretreatment: Standard Pretreatment.

Comment: Sample (2.66[illegible] g C_6H_6) counted for 2,800 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B6

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5207 Date Received: 12/21/84

Your Reference: VR 22 Date Reported: 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WESGR

Sample Name: Sapric Peat (clay)

AGE = 5590 +/- 100 years BP

Description: Sapric peat (clay) collected from the Sale-Teche-Cypremort Basin at a depth of -725 to -740 cm in a natural levee environment.

Pretreatment: Standard pretreatment.

Comment: Sample (2.6119 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27‰ for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B63

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5205 **Date Received:** 12/21/84

Your Reference: VR 48 **Date Reported:** 03/15/85

Submitted by:
Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic Peat (clay)

AGE = 2040 +/- 60 years BP

Description: Hemic peat (clay) collected from the Sale-Teche-Cypremort inter-distributary basin at a depth of -165 to -175 cm in a fresh marsh environment

Pretreatment: Modern rootlets removed and then standard pretreatment procedures followed.

Comment: Sample (2.6117 g C_6H_6) counted for 3,800 min.

δC^{13}_{PDB} : % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B64

LOUISIANA GEOLOGICAL SURVEY
RADIOCARBON LABORATORY

RM. 151, GEOLOGY BUILDING, LSU, BATON ROUGE, LA 70803
(504) 342-6827

RADIOCARBON AGE DETERMINATION REPORT OF ANALYTICAL WORK

Our Sample No. TX 5208 **Date Received:** 12/21/84

Your Reference: VR 75 **Date Reported:** 03/15/85

Submitted by: Lawson Smith
US Army Corps of Engineers
Waterways Experiment Station; WESGR
PO Box 631
Vicksburg, Miss. 39180-0631 WEGTR

Sample Name: Hemic peat (clay)

AGE = 1400 +/- 80 years BP

Description: Hemic peat (clay) collected from the Sale-Teche-Cypremort interdistributary basin at a depth of -169 to -182 cm in a poorly drained swamp environment.

Pretreatment: Modern rootlets removed and then standard pretreatment procedures followed.

Comment: Sample (2.6100 g C_6H_6) counted for 1,400 min.

δC^{13}_{PDB} = % Not requested, therefore, mean value of -27% for peats and humus used in age calculation.

Note: This date is a "conventional radiocarbon age" as defined by Stuiver and Polack (1977). The standard used is the 1978 N.B.S. oxalic acid (RM-4990-C).

PLATE B65

APPENDIX C

ARCHEOLOGICAL DATA

LEGEND

SITE TYPE

EM	EARTH MOUND
M	MOUND
SM	SHELL MIDDEN
WW	WAVE WASH SITE

LANDFORM

ACm	ABANDONED MISSISSIPPI RIVER COURSE
ACr	ABANDONED RED RIVER COURSE
AD	ABANDONED DISTRIBUTARY
A	ACTIVE DISTRIBUTARY
BH	BEACH (SALT WATER)
BS	BACKSWAMP
CC	CREVASSE CHANNEL
IS	INLAND SWAMP
LDC	LACUSTRINE DELTA CHANNEL
LS	LAKE SHORE (FRESH WATER)
NL	NATURAL LEVEE
SD	SALT DOME
TC	TIDAL CHANNEL

CULTURAL ASSOCIATION

PL	PLAQUEMINE
MS	MISSISSIPPI
CC	COLES CREEK
BT	BAYTOWN
TR	TROYVILLE
MV	MARKSVILLE
TCH	TCHEFUNCTE
PP	POVERTY POINT

PLATE C1

SITE NUMBER	QUAD NO.	7.5 USGS QUADRANGLE	CULTURAL ASSOCIATION	SITE TYPE	LANDFORM
SL 20	7	PORTAGE	PL	M,SM	ACr
SL 34	7	PORTAGE		M	AD
SM 52	10	CECILIA			ACm
SM 3	11	BUTTE LA ROSE			AD
SM 4	11	BUTTE LA ROSE		M	CC
SM 11	11	BUTTE LA ROSE			AD
SM 12	11	BUTTE LA ROSE			AD
SM 1	14	CATAHOULA		M	AD
SM 10	15	L.MONGOULOIS		M	AD
SM 16	15	L.MONGOULOIS		M	D
SM 33	15	L.MONGOULOIS	CC,PL	SM	AD
SM 8	16	GRAND RIVER		M	AD
IV 15	16	GRAND RIVER		M	AD
IV 4	17	BAYOU SORREL	PP,TCH,CC,MS	M	AD
IB 9	20	LAKE CHICOT		EM	AD
IB 10	20	LAKE CHICOT		EM	LDC
IB 45	20	LAKE CHICOT		EM	LDC
IB 46	20	LAKE CHICOT		EM	LDC
IB 47	20	LAKE CHICOT		EM	LDC
IB 111	20	LAKE CHICOT	PL	SM	AD
IB 8	21	PIGEON	CC,PL	SM	AD
IB 110	21	PIGEON	CC	ESM	AD
IB 42	22	CHARENTON		SM	LDC
IB-43	22	CHARENTON		SM	LDC
IB 44	22	CHARENTON		SM	LDC
SMY 2	22	CHARENTON	TR,CC,	SM	ACm
SMY 43	22	CHARENTON		BH	LDC
IB 5	23	CENTERVILLE NW		SM	LD
IB 6	23	CENTERVILLE NW		SM	BS
IB 11	23	CENTERVILLE NW		SM	AD
IB 12	23	CENTERVILLE NW		SM	AD
IB 2	23	CENTERVILLE NW		SM	AD
IB 13	24	CENTERVILLE NE		SM	BS
SM 49	24	CENTERVILLE NE		WW	AD
IB 4	24	CENTERVILLE NE		SM	BS
IB 52	24	CENTERVILLE NE	CC,PL	SM	AD
SMY 100	26	KEMPER	PL	SD	SD
SMY 101	26	KEMPER	PL	SM	SD
SMY 113	28	CENTERVILLE	PL	SM	ACm
SMY 114	28	CENTERVILLE	TR,CC	SM	ACm
SMY 115	28	CENTERVILLE	PL	SM	ACm
SMY 116	28	CENTERVILLE	TR,CC	SM	ACm
SMY 117	28	CENTERVILLE	PL	SM	ACm
SM 31	29	TIGER IS.		SM	LS
SM 32	29	TIGER IS.		SM	LS
SMY 42	32	ELLERSLIE	MV,CC	SM	AD
SMY 152	32	ELLERSLIE	CC	RS	AD
SMY 153	32	ELLERSLIE	CC	RS	AD
SMY 154	32	ELLERSLIE	TCH,MV,CC	RS,WW	BM
SMY 159	32	ELLERSLIE			AD

PLATE C2

SITE NUMBER	QUAD NO.	7.5 USGS QUADRANGLE	CULTURAL ASSOCIATION	SITE TYPE	LANDFORM
SMY 31	33	N. BEND	CC	M,WW	FM
SMY 35	33	N. BEND		SM	ACm
SMY 132	33	N. BEND	TCH	SM	AD
SM 10	34	PATTERSON	CC,PL	SM,M	ACm
SMY 18	34	PATTERSON		M,SM	PB
SMY 36	34	PATTERSON		SM	CC
SMY 37	34	PATTERSON		SM	LS
SMY 105	34	PATTERSON	PL	SM	LS
SMY 107	34	PATTERSON		SM	LS
SMY 163	34	PATTERSON	PL	SM	LS
SM 27	35	MORGAN CITY			LS
SMY 55	35	MORGAN CITY			AD
SMY 108	35	MORGAN CITY		SM	PB
SMY 130	35	MORGAN CITY	CC	SM	ACm
SMY 131	35	MORGAN CITY		SM	AD
SMY 53	35	MORGAN CITY	CC	SM	AD
SMY 50	35	MORGAN CITY	CC	SM	AD
SMY 56	35	MORGAN CITY		SM	AD
SMY 57	35	MORGAN CITY		SM	AD
SMY 65	35	MORGAN CITY	CC	EM	ACm
SMY 104	35	MORGAN CITY		EM	ACm
SMY 164	35	MORGAN CITY		SM	ACm
SMY 165	35	MORGAN CITY		SM	ACm
SM 26	36	AMELIA			LS
AS 14	36	AMELIA		SM	LS
AS 16	36	AMELIA	CC	EM	ACm
AS 19	36	AMELIA		SM	ACm
AS 20	36	AMELIA		SM	AD
AS 35	36	AMELIA		SM	ACm
AS 36	36	AMELIA		SM	ACm
AS 37	36	AMELIA	CC		AD
TR 82	36	AMELIA	BT,CC	M	ACm
TR 110	36	AMELIA	PL	SM	AD
SMY 20	36	AMELIA	CC	EM	AD
SMY 44	36	AMELIA			ACm
SMY 62	36	AMELIA	CC	SEM	AD
SMY 63	36	AMELIA	CC	SEM	AD
SMY 64	36	AMELIA	CC	SM	AD
SMY 129	36	AMELIA	CC,PL	SM	AD
SMY 146	36	AMELIA	MV,MS	SM	LS
SMY 6	38	PT. CHEVREUIL		EM	AD
SMY 17	38	PT. CHEVREUIL		SM	AD
SMY 40	38	PT. CHEVREUIL		SH,SM	IS
SMY 118	38	PT. CHEVREUIL		RS	AD
SMY 155	38	PT. CHEVREUIL	TCH,BT	RS	AD
SMY 158	38	PT. CHEVREUIL		SS	AD
SMY 157	38	PT. CHEVREUIL	PP,CC		AD
SMY 27	39	BELLE ISLE		M,WW	SP
SMY 32	39	BELLE ISLE		SM,WW	FM
SMY 33	39	BELLE ISLE		SM	IS
SMY 102	39	BELLE ISLE	PP,TCH	SM	SD

PLATE C3

SITE NUMBER	QUAD NO.	7.5 USGS QUADRANGLE	CULTURAL ASSOCIATION	SITE TYPE	LANDFORM
SMY 103	39	BELLE ISLE		SM	SD
SMY 160	39	BELLE ISLE			SD
SMY 161	39	BELLE ISLE	BT		SD
SMY 162	39	BELLE ISLE	BT		SD
SMY 29	40	LAKE SALVE		SM	FM
TR 85	40	LAKE SALVE		SM	FM
SMY 21	40	LAKE SALVE		SM	FM
SMY 22	40	LAKE SALVE		SM	FM
SMY 23	40	LAKE SALVE		SM	FM
SMY 25	40	LAKE SALVE	CC,PL	SM,WW	FM
SMY 26	40	LAKE SALVE		SM	FM
SMY 28	40	LAKE SALVE		BH,WW	FM
SMY 30	40	LAKE SALVE		SM	IS
TR 104	41	MORGAN CITY SW	PL		AD
TR 105	41	MORGAN CITY SW			AD
TR 109	41	MORGAN CITY SW			AD
SMY 39	41	MORGAN CITY SW	TR,CC	WW	FM,AD
SMY 47	41	MORGAN CITY SW	CC	SM,WW	LS
SMY 48	41	MORGAN CITY SW	CC	SM	AD
SMY 49	41	MORGAN CITY SW		SM	AD
SMY 59	41	MORGAN CITY SW	TR,CC	SM,WW	FM,AD
TR 106	42	MORGAN CITY SE			AD
TR 107	42	MORGAN CITY SE		SM	AD
TR 108	42	MORGAN CITY SE	PL		AD
SMY 46	42	MORGAN CITY SE	PL	SM	AD
TR 83	42	MORGAN CITY SE		SM	AD
TR 84	42	MORGAN CITY SE	CC	SM	AD
TR 1	44	HUMPHREYS	MV	EM	ACm
TR 70	44	HUMPHREYS		SM	AD
TR 73	44	HUMPHREYS	MV,CC	SM	AD
TR 78	44	HUMPHREYS		SM	ACm
TR 87	44	HUMPHREYS		SM	AD
TR 88	46	POINT AUF NE		WW	FM
TR 102	46	POINT AUF NE		WW	FM
TR 103	46	POINT AUF NE		WW	FM
TR 36	47	PLUMB BAYOU		WW	FM
TR 67	47	PLUMB BAYOU		SM	FM
TR 68	47	PLUMB BAYOU		SM,WW	FM
TR 65	48	CARENCRO BAYOU		SM	AD
TR 66	48	CARENCRO BAYOU		SM	BM
TR 46	49	LAKE PENCHNT		SM	AD
TR 4	49	LAKE PENCHANT		SM	BH
TR 40	49	LAKE PENCHANT			AD
TR 47	49	LAKE PENCHANT	MS	SM	BH
TR 50	49	LAKE PENCHANT	CC	SM	AD
TR 76	49	LAKE PENCHANT		SM	AD
TR 77	49	LAKE PENCHANT		SM	BH
TR 112	49	LAKE PENCHANT		SM	BH
TR 113	49	LAKE PENCHANT	CC	SM	AD
TR3	50	LAKE THERIOT		SM	AD
TR 19	50	LAKE THERIOT		PM	AD

PLATE C4

SITE NUMBER	QUAD NO.	7.5 USGS QUADRANGLE	CULTURAL ASSOCIATION	SITE TYPE	LANDFORM
TR 43	50	LAKE THERIOT		SM	AD
TR 49	50	LAKE THERIOT		SM	AD
TR 69	50	LAKE THERIOT		SM	AD
TR 71	50	LAKE THERIOT	PL	SM	AD
TR 75	50	LAKE THERIOT		SM	AD
TR 96	50	LAKE THERIOT			AD
TR 111	50	LAKE THERIOT	CC	SM	BM
TR 48	50	LAKE THERIOT		SM	AD
TR 27	52	FOURLEAGUE BAY		SM,WW	BM
TR 21	53	LOST LAKE		SM,WW	AD
TR 28	53	LOST LAKE		SM,WW	AD
TR 64	53	LOST LAKE		SM	BM
TR 8	54	LAKE MECHANT		SM	AD
TR 24	54	LAKE MECHANT		SM	AD
TR 25	54	LAKE MECHANT		SM	AD
TR 30	54	LAKE MECHANT		SM	AD
TR 31	54	LAKE MECHANT		SM	AD
TR 41	54	LAKE MECHANT			AD
TR 42	54	LAKE MECHANT		SM	AD
TR 45	54	LAKE MECHANT		SM	AD
TR 53	54	LAKE MECHANT		SM	AD
TR 54	54	LAKE MECHANT		SM	AD
TR 55	54	LAKE MECHANT		SM	AD
TR 56	54	LAKE MECHANT		SM	AD
TR 57	54	LAKE MECHANT		SM	AD
TR 58	54	LAKE MECHANT		WW	AD
TR 20	55	BAYOU SAUVEUR		SM	AD
TR 52	55	BAYOU SAUVEUR	PL	SM	AD
TR 51	55	BAYOU SAUVEUR		SM	AD

PLATE C5

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